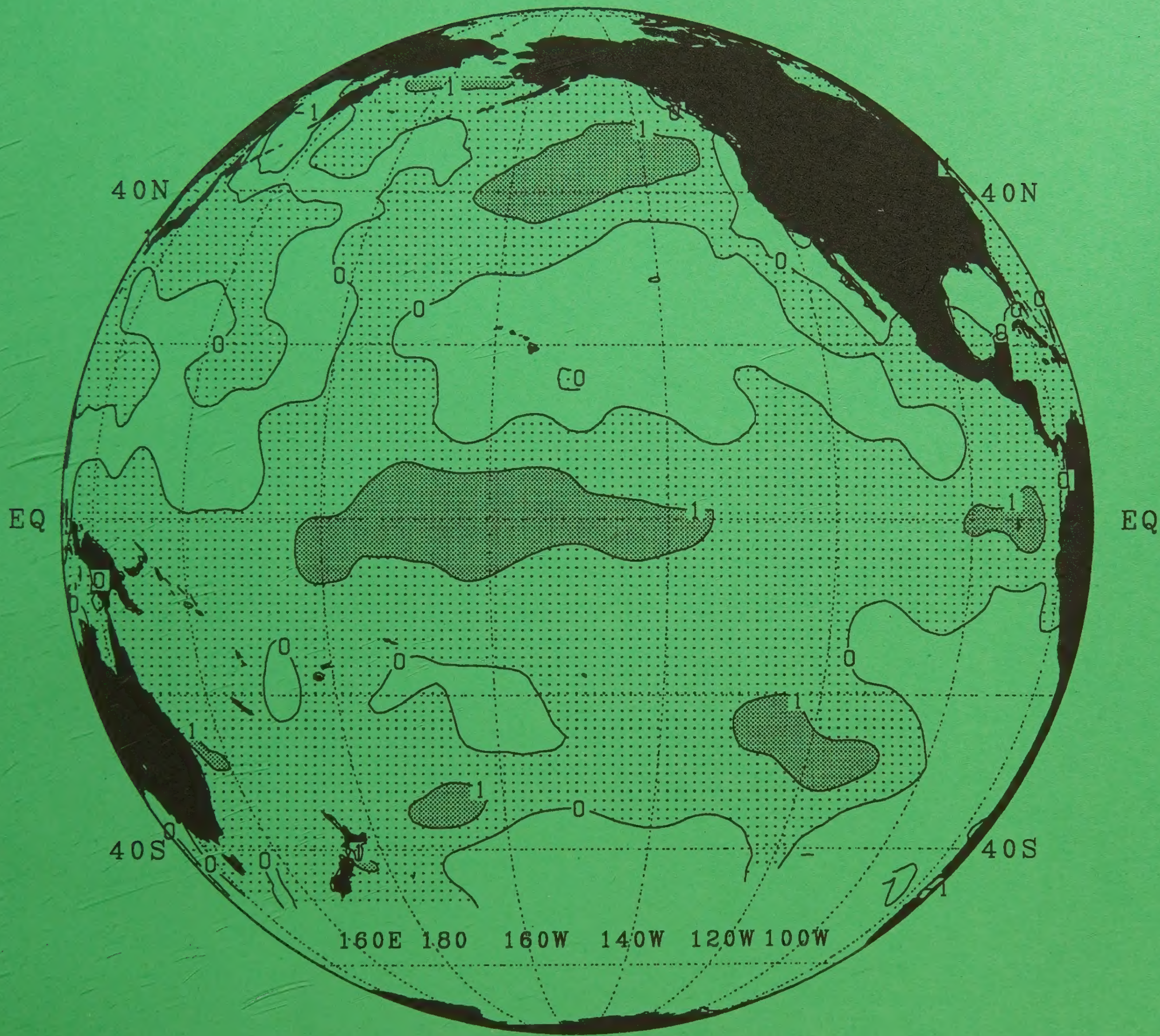
気 象 庁 海 洋 月 報

Monthly Ocean Report
September 2002 (No. 117)



Climate and Marine Department
Japan Meteorological Agency

気象庁 気候・海洋気象部

平成14年9月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
本月報に関する問い合わせは、

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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2002 年 9 月の太平洋の月平均海面水温偏差図です。

陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for September 2002 in the Pacific Ocean.

Areas of positive anomalies are shaded.

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海況の特徴（２００２年９月）

日本近海の海況

海面水温は、日本海を除く40°N以北で平年より低く、オホーツク海南部から北海道の東方では－1℃を超える負偏差が見られた。北海道の南東を除く沿岸部では平年より高く、能登半島から秋田沖、北海道西岸、および東海沿岸では平年より1℃以上高かった（図4）。

黒潮は、九州の南東で小さく蛇行し、紀伊半島に接岸した後、東海沖を東北東に流れていた。その後上旬は三宅島の北を通り、房総半島に接岸した後、東北東に流れていた。中・下旬は三宅島付近を通り、房総半島沖を北東に流れていた（図９）。

太平洋の海況

太平洋赤道域の海面水温は、175°Eから135°Wにかけてと105°Wからエクアドル沖にかけての広い範囲で、＋1℃を超える正偏差が見られた。

北太平洋の海面水温は、40°N～50°Nの165°Wから北米大陸西岸にかけての海域で平年より1℃以上高かった（図１７）。

Highlights September 2002

Seas adjacent to Japan

SSTs were below normal in seas north of 40°N except in the Japan Sea. Negative SST anomalies exceeding -1℃ were found in the southern part of the Sea of Okhotsk and east of Hokkaido. SSTs were above normal along coasts of Japan except southeast of Hokkaido. Positive SST anomalies exceeding +1℃ were found along coasts from the Noto Peninsula to Akita, west off Hokkaido and off Tokai (Fig. 4).

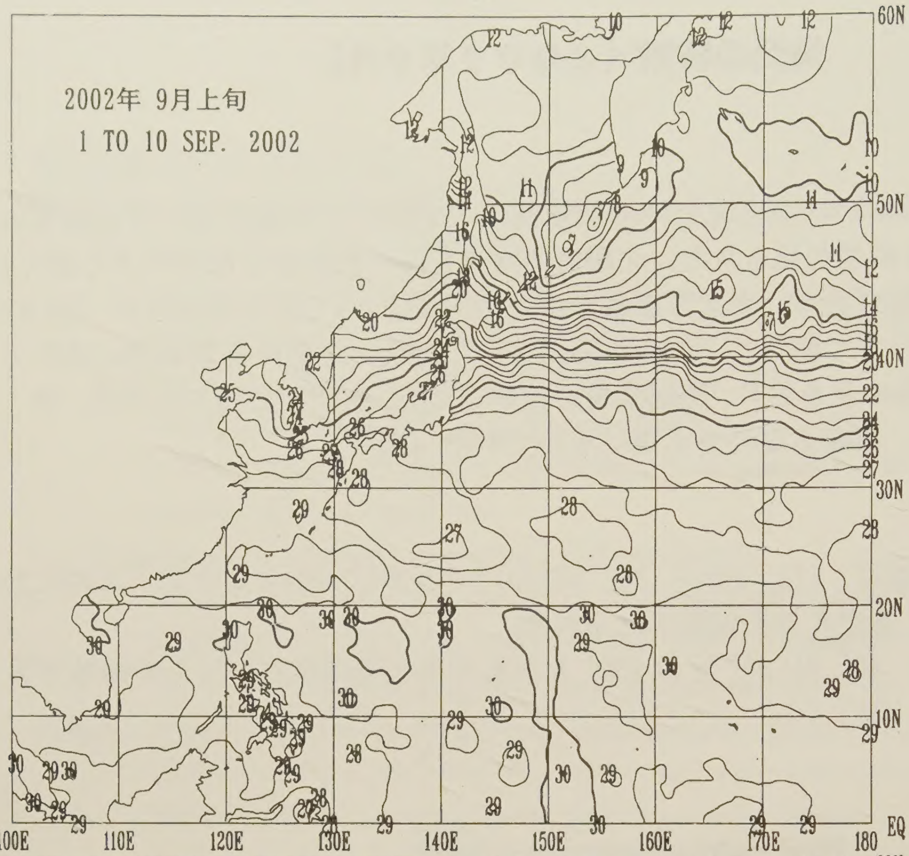
The Kuroshio flowed southeast of Kyushu with a small meander, close to the Kii Peninsula, and flowed ENE-ward off Tokai throughout the month. In the first 10 days, it passed north of Miyake Island and flowed ENE-ward off the Boso Peninsula. In the rest of the month, it passed near Miyake Island and flowed NE-ward off the Boso Peninsula (Fig. 9).

Pacific Ocean

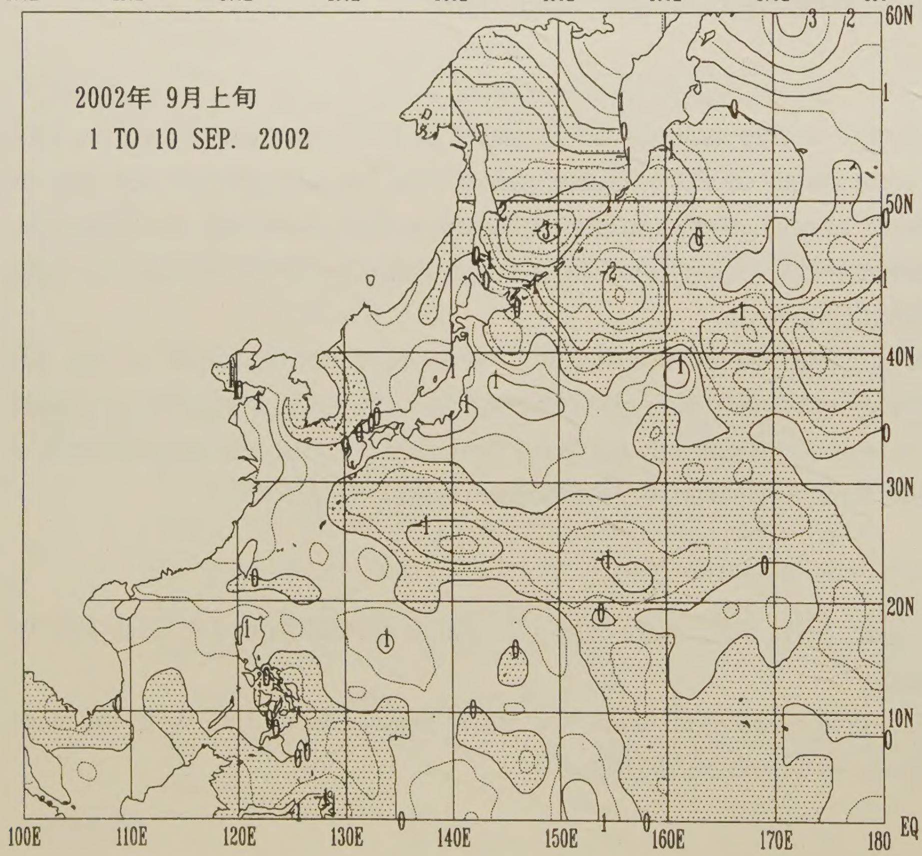
In the equatorial Pacific, SSTs were more than 1℃ above normal from 175°E to 135°W and from 105°W to off Ecuador.

In the North Pacific, SSTs were more than 1℃ above normal from 165°W to the west Coast of North America between 40°N and 50°N (Fig. 17).

Ten-day mean SST & Anomalies

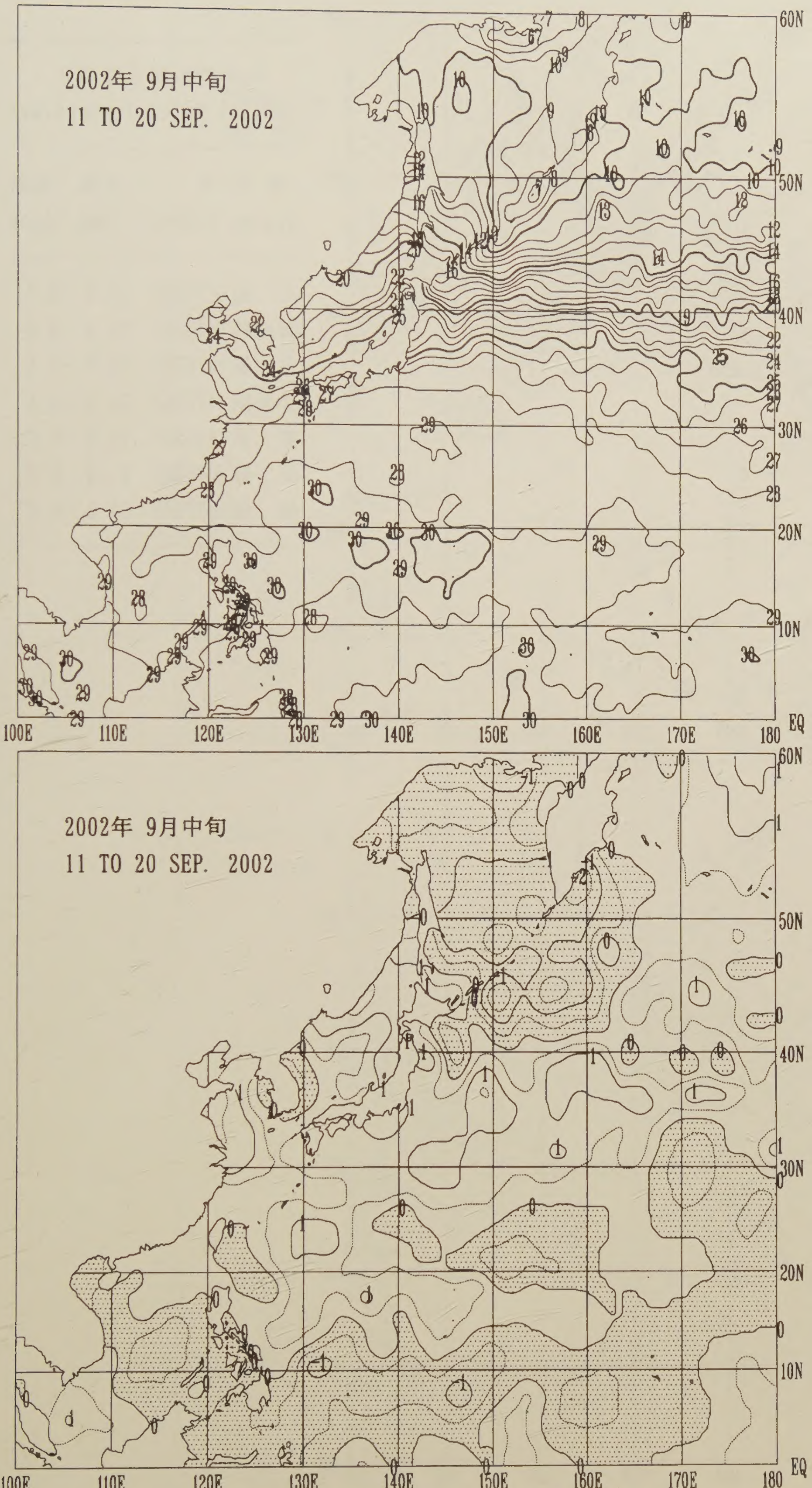


旬平均沿岸水温 (℃) Coastal Water Temperature		
地 点 名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣 (47918)	28.3	-0.5
御前崎 (47655)	27.4	1.8
八丈島 (47678)	27.5	0.4
小名浜 (47598)	21.9	-0.3
宮　古 (47585)	20.0	-0.3
江　差 (47428)	23.3	0.0
浜　田 (47755)	26.3	-0.3



第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2002年 9月上旬)

Fig. 1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in SEP 2002. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



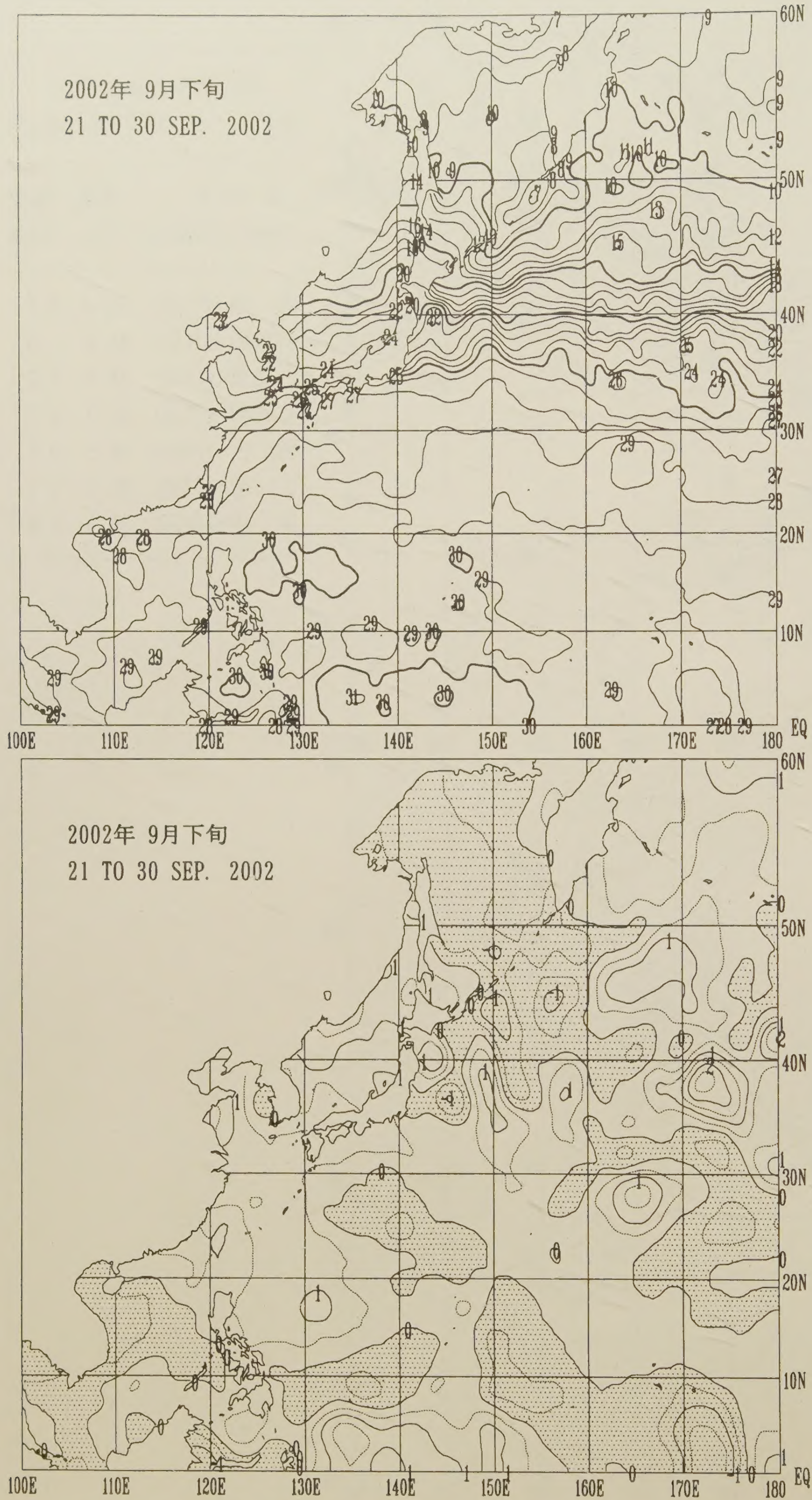
旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	28.6	0.1
御前崎(47655)	26.0	1.3
八丈島(47678)	26.9	0.2
小名浜(47598)	21.3	-0.7
宮　古(47585)	20.9	0.7
江　差(47428)	22.5	0.1
浜　田(47755)	25.3	0.0

第2図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2002年 9月中旬)

Fig. 2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in SEP 2002. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

Ten-day mean SST & Anomalies



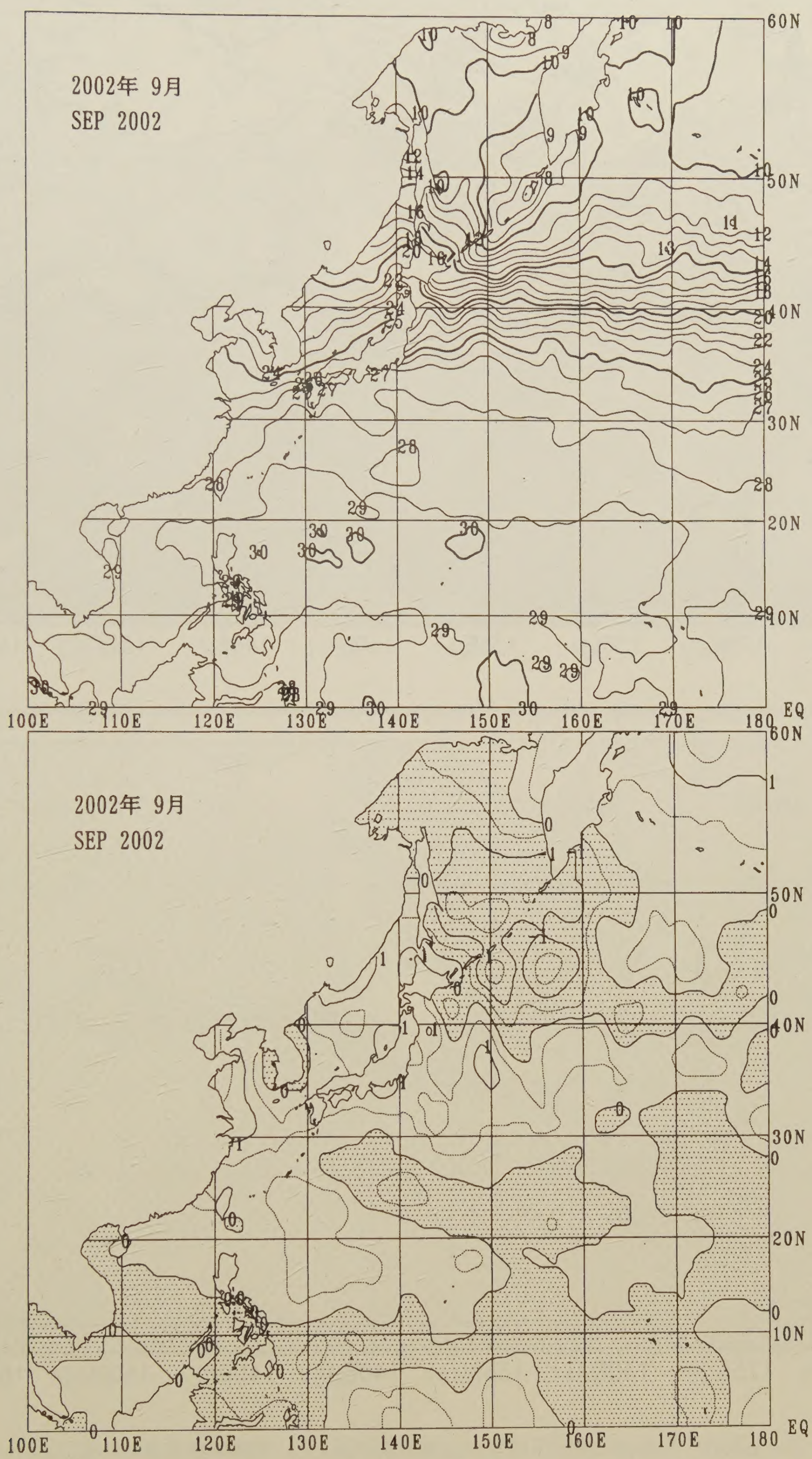
旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	28.0	0.2
御前崎(47655)	23.6	0.0
八丈島(47678)	25.5	-0.4
小名浜(47598)	20.6	-0.8
宮　古(47585)	19.2	-0.5
江　差(47428)	21.0	0.2
浜　田(47755)	24.0	0.0

第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2002年 9月下旬)

Fig. 3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in SEP 2002. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

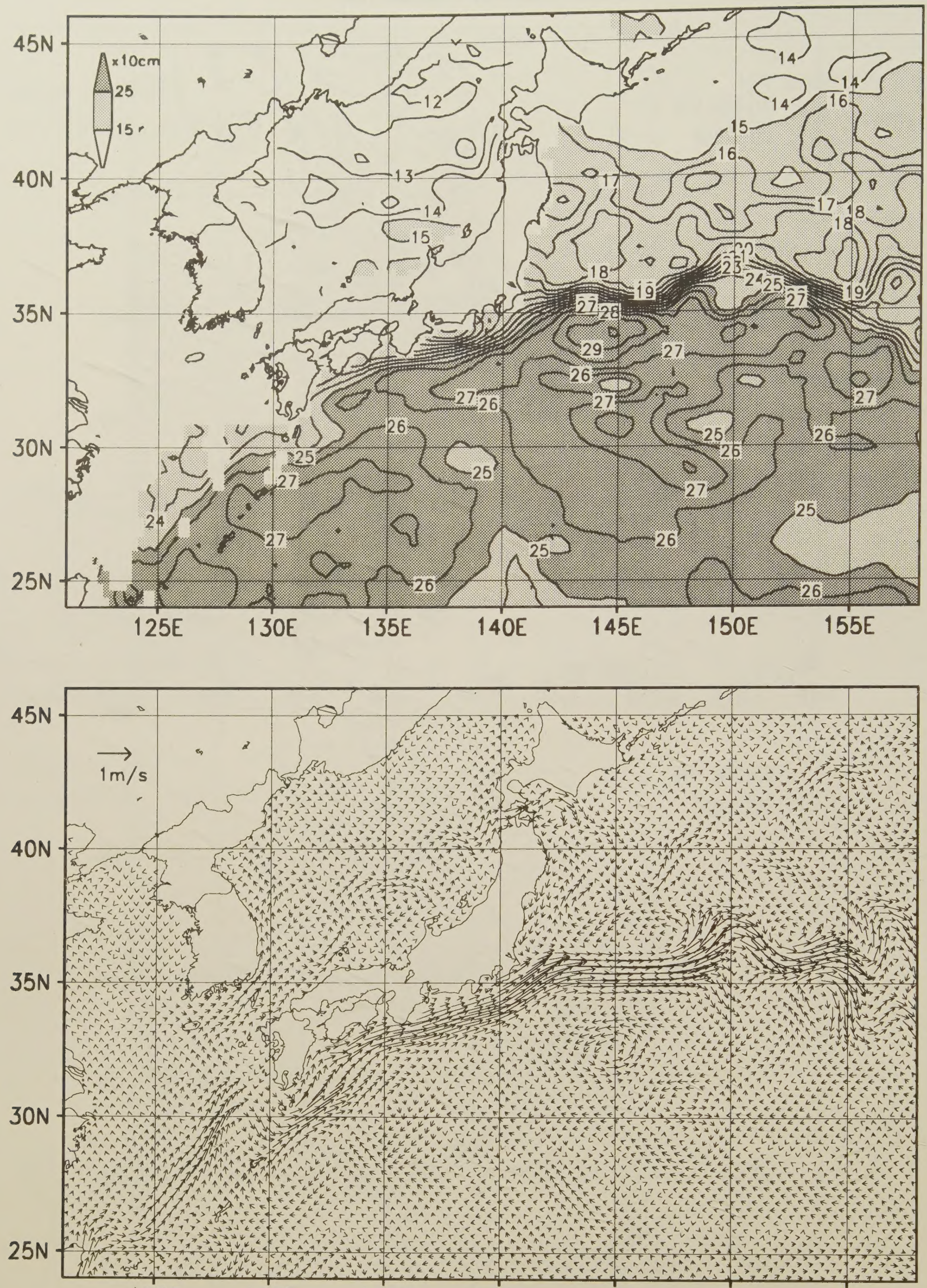
Monthly Mean SST & Anomalies



第4図 北西太平洋月平均海面水温図(上)及び偏差図(下) (2002年 9月)

Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for SEP 2002. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

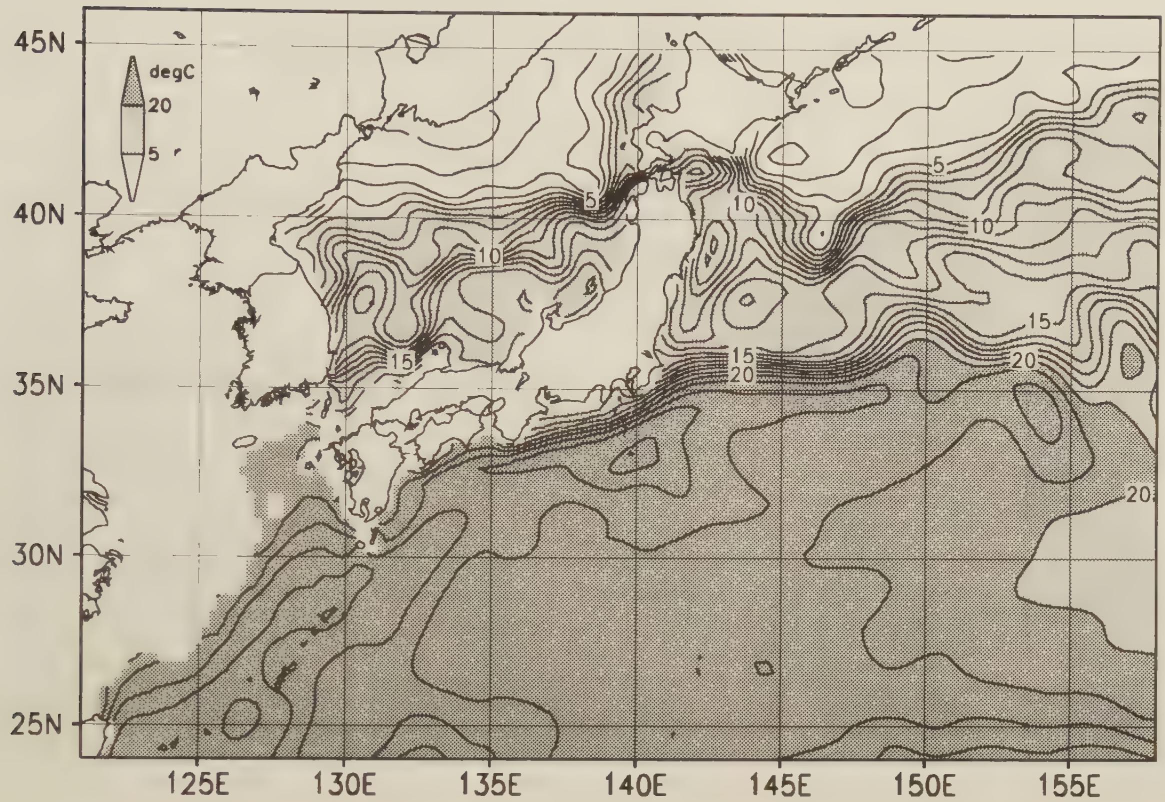
Dynamic Height / Sea Surface Current Adjacent to Japan

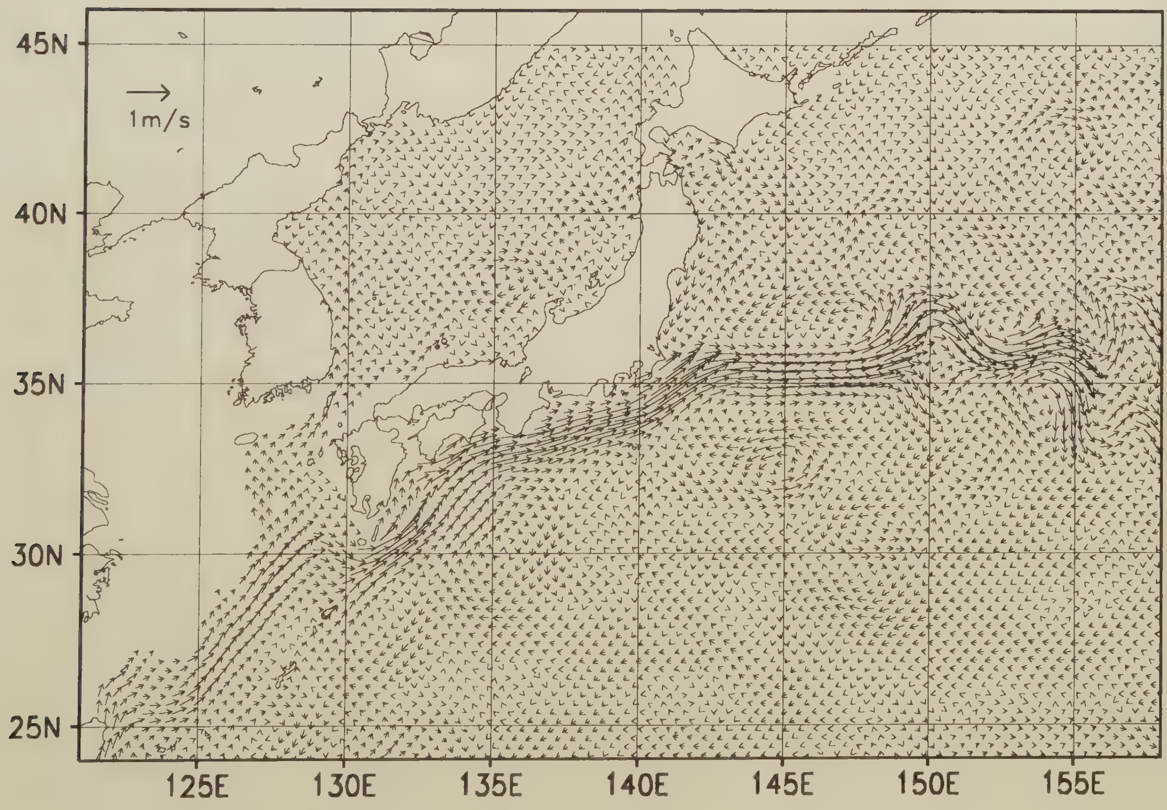


第５図　日本近海月平均海面高度分布図（上）と海面海流図（下）（2002 年 9 月）
（海洋総合解析システムによる）

Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for September 2002. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)

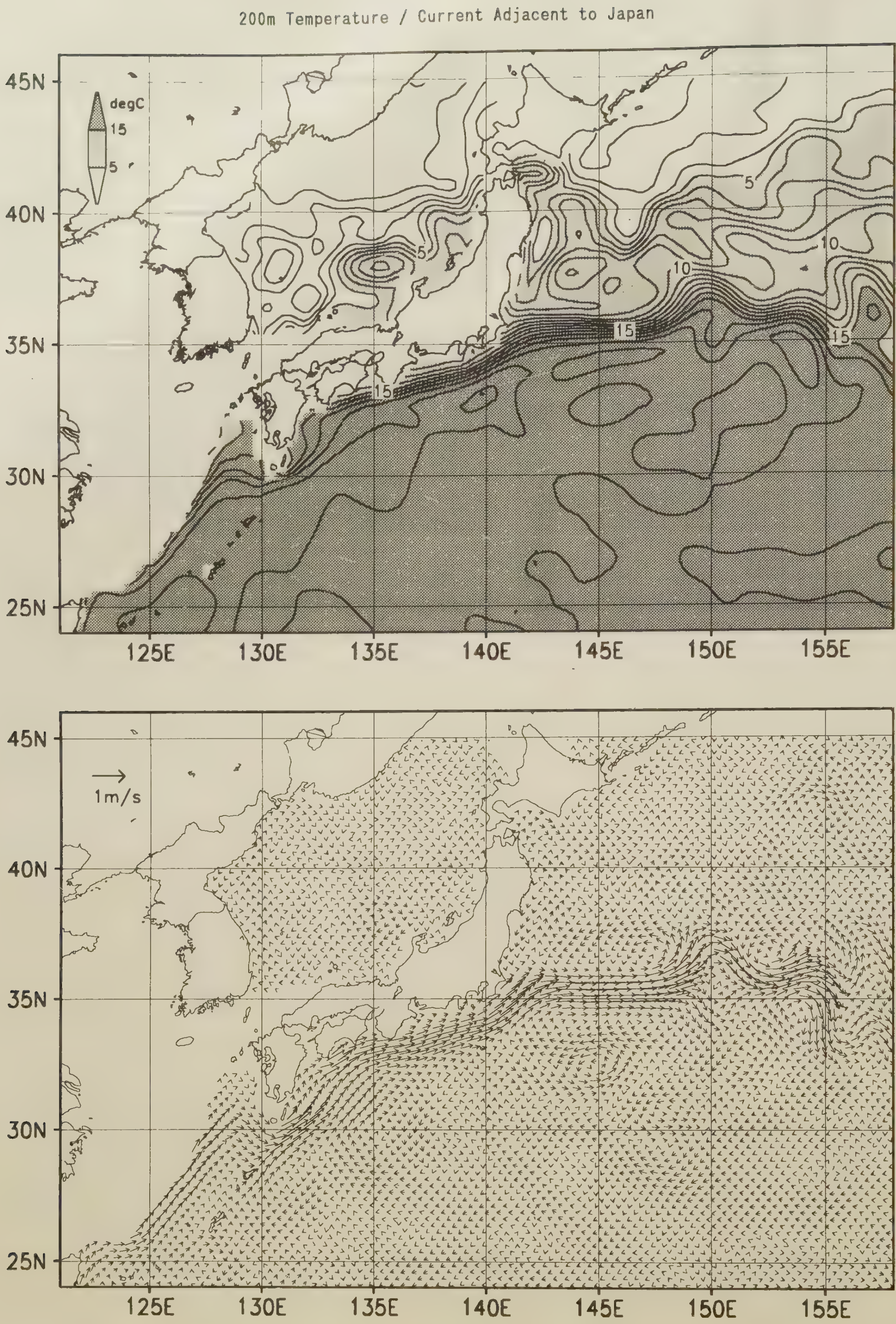
100m Temperature / Current Adjacent to Japan





第6図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 100 m）（2002 年 9 月）
（海洋総合解析システムによる）

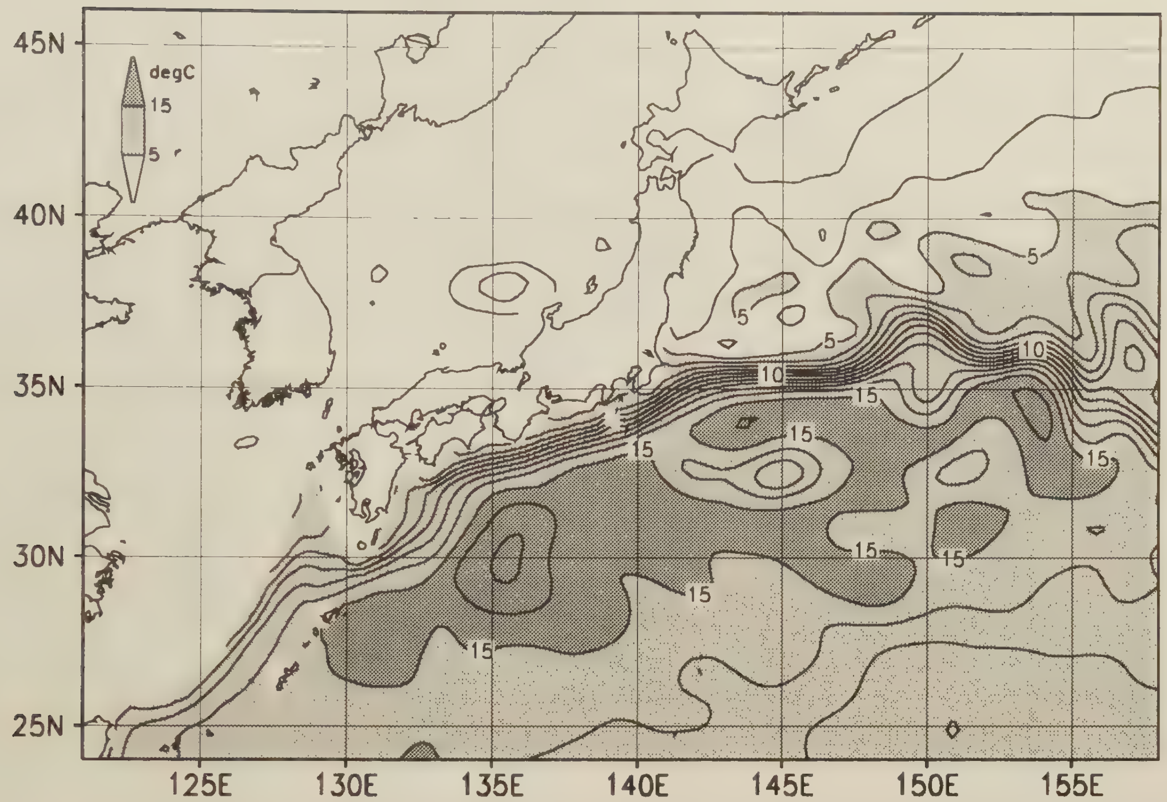
Fig. 6　Monthly mean subsurface (100 m) temperature (top) and current (bottom) in seas adjacent to Japan for September 2002. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)

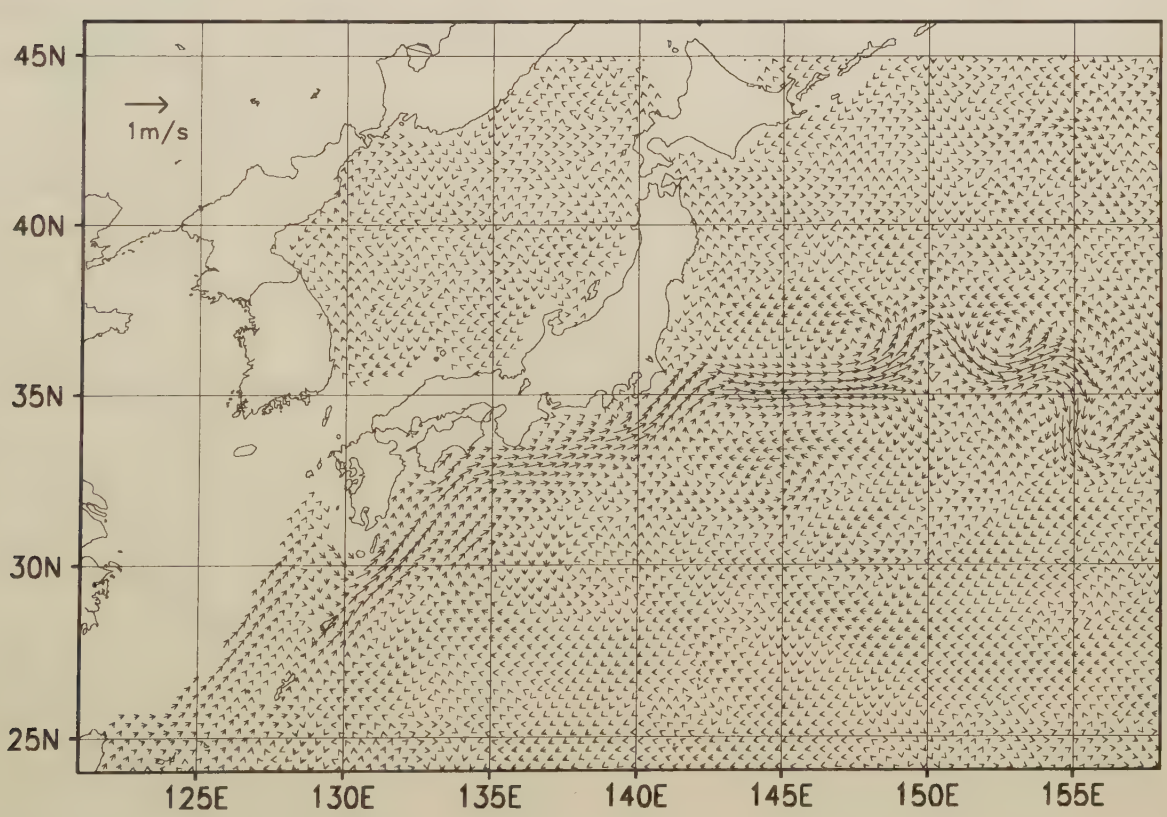


第７図　日本近海月平均表層水温図（上）と表層海流図（下）　（深さ 200 m）（2002 年 9 月）
（海洋総合解析システムによる）

Fig. 7　Monthly mean subsurface (200 m) temperature (top) and current (bottom) in seas adjacent to Japan for September 2002. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)

400m Temperature / Current Adjacent to Japan

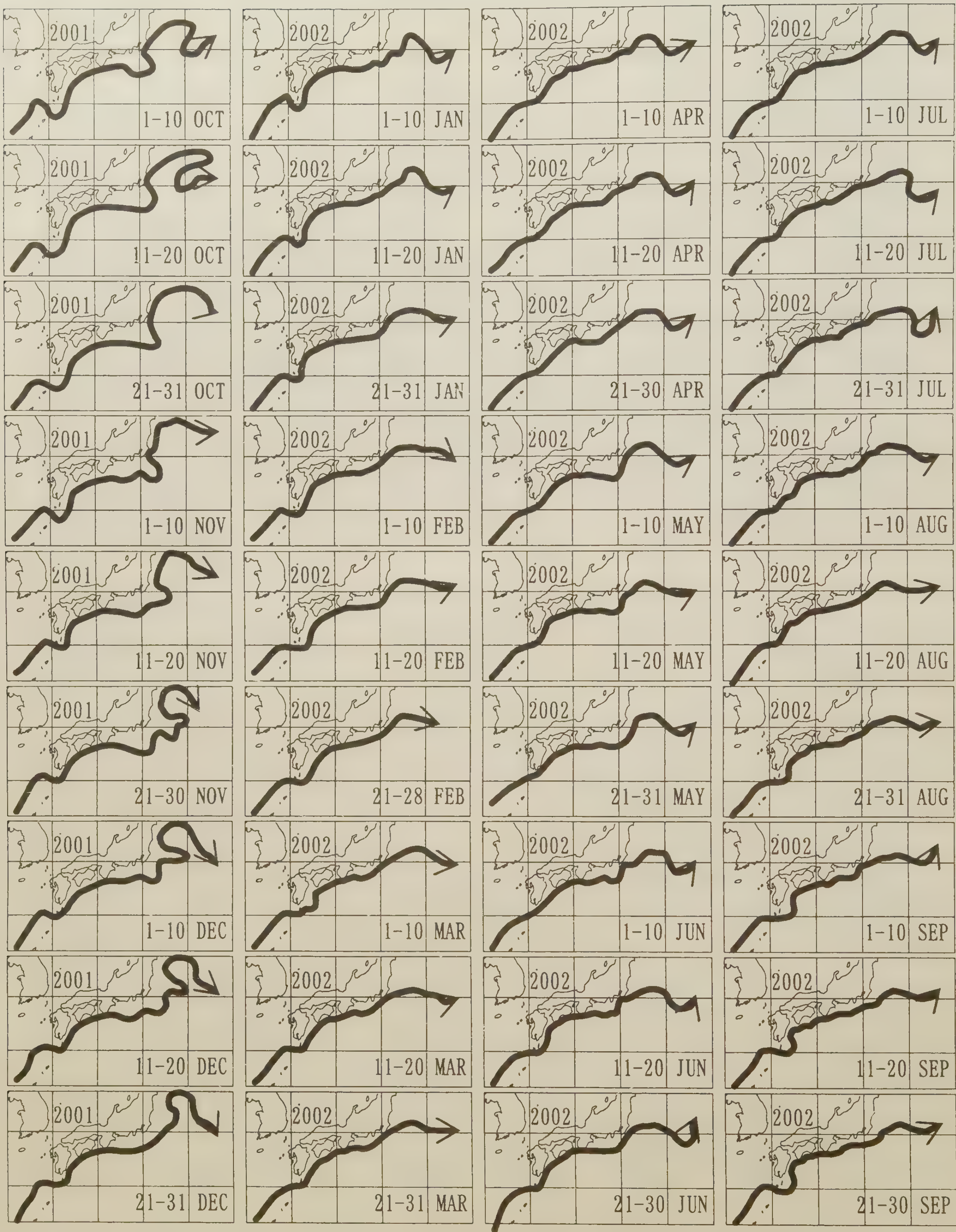




第8図　日本近海月平均表層水温図（上）と表層海流図（下）（深さ 400 m）（2002 年 9 月）
（海洋総合解析システムによる）

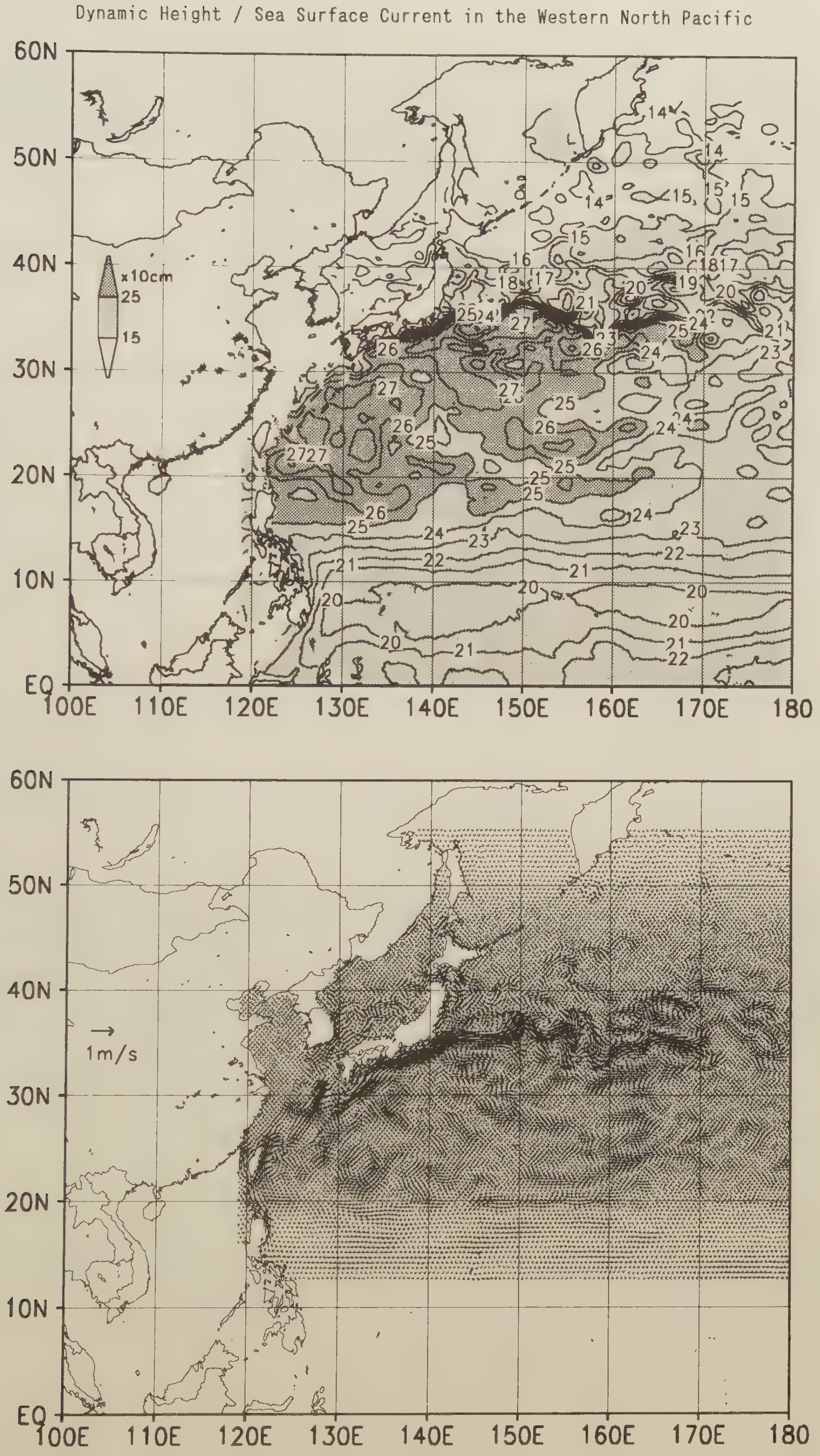
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Location of the Kuroshio axis



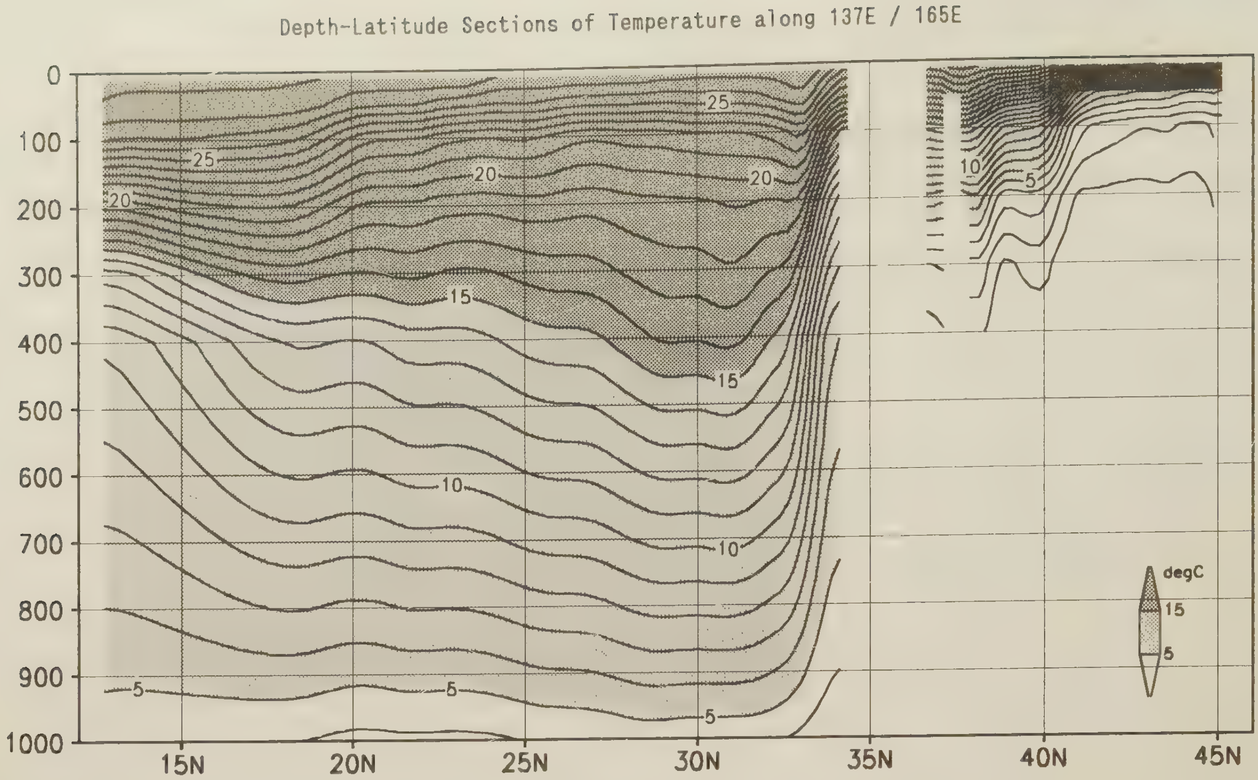
第9図 旬別黒潮流軸図

Fig. 9 Location of the Kuroshio axis



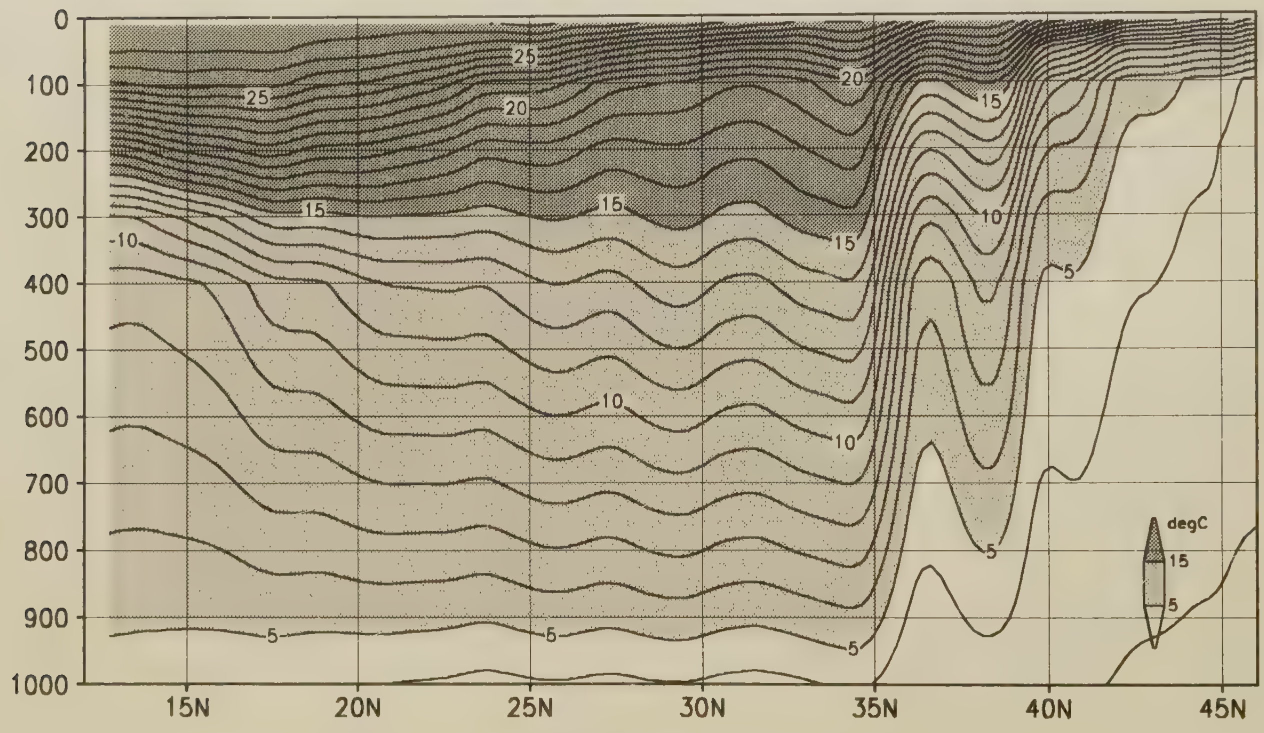
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Fig. 10　Monthly mean sea surface height (top) and current (bottom) in the western North Pacific for September 2002. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



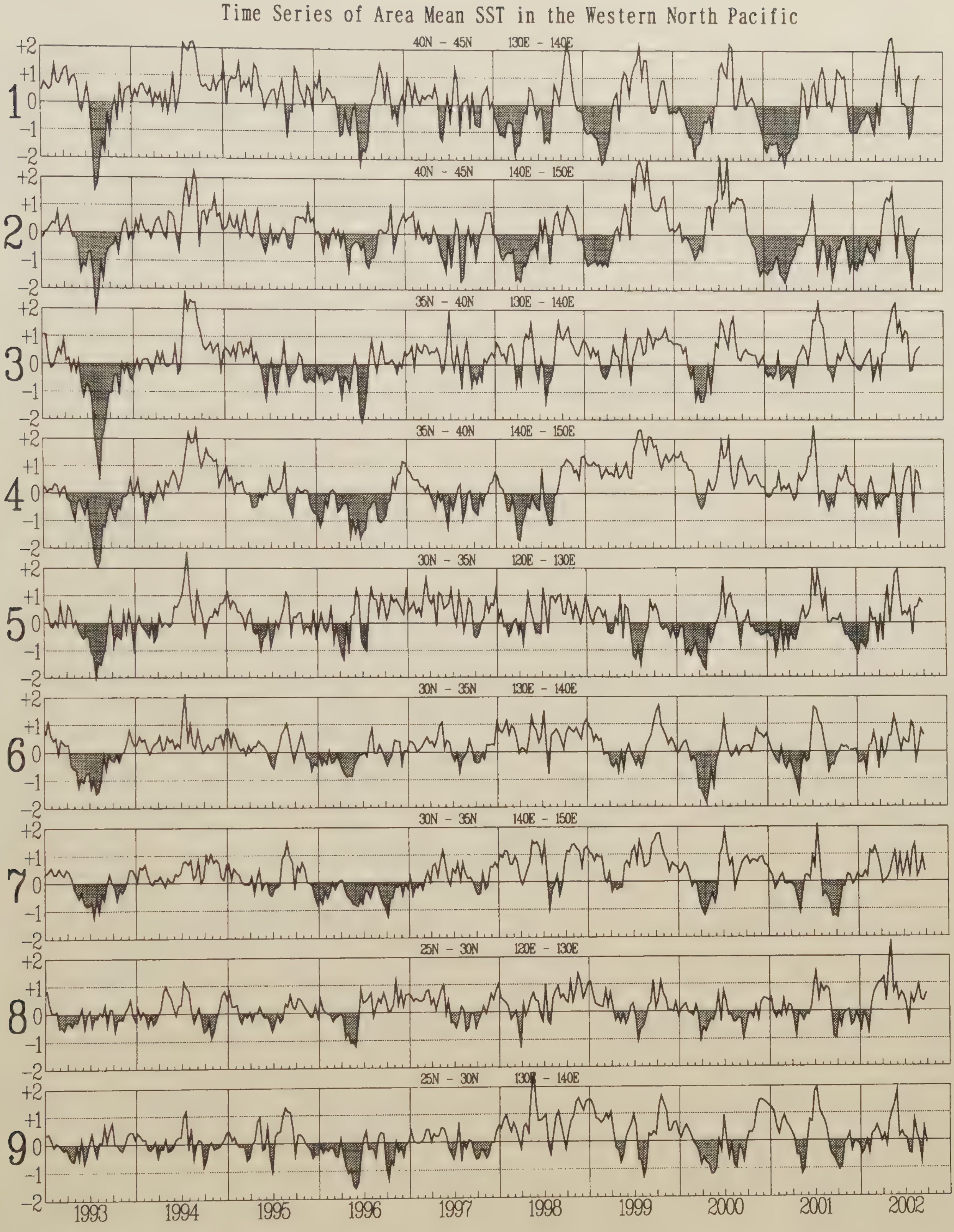
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（海洋総合解析システムによる）

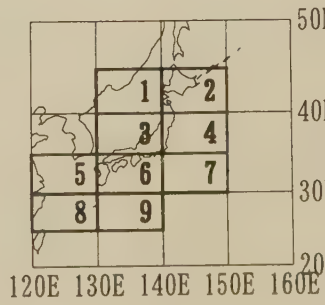
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第 12 図　東経 165°線に沿う月平均表層水温の鉛直断面図（2002 年 9 月）
（海洋総合解析システムによる）

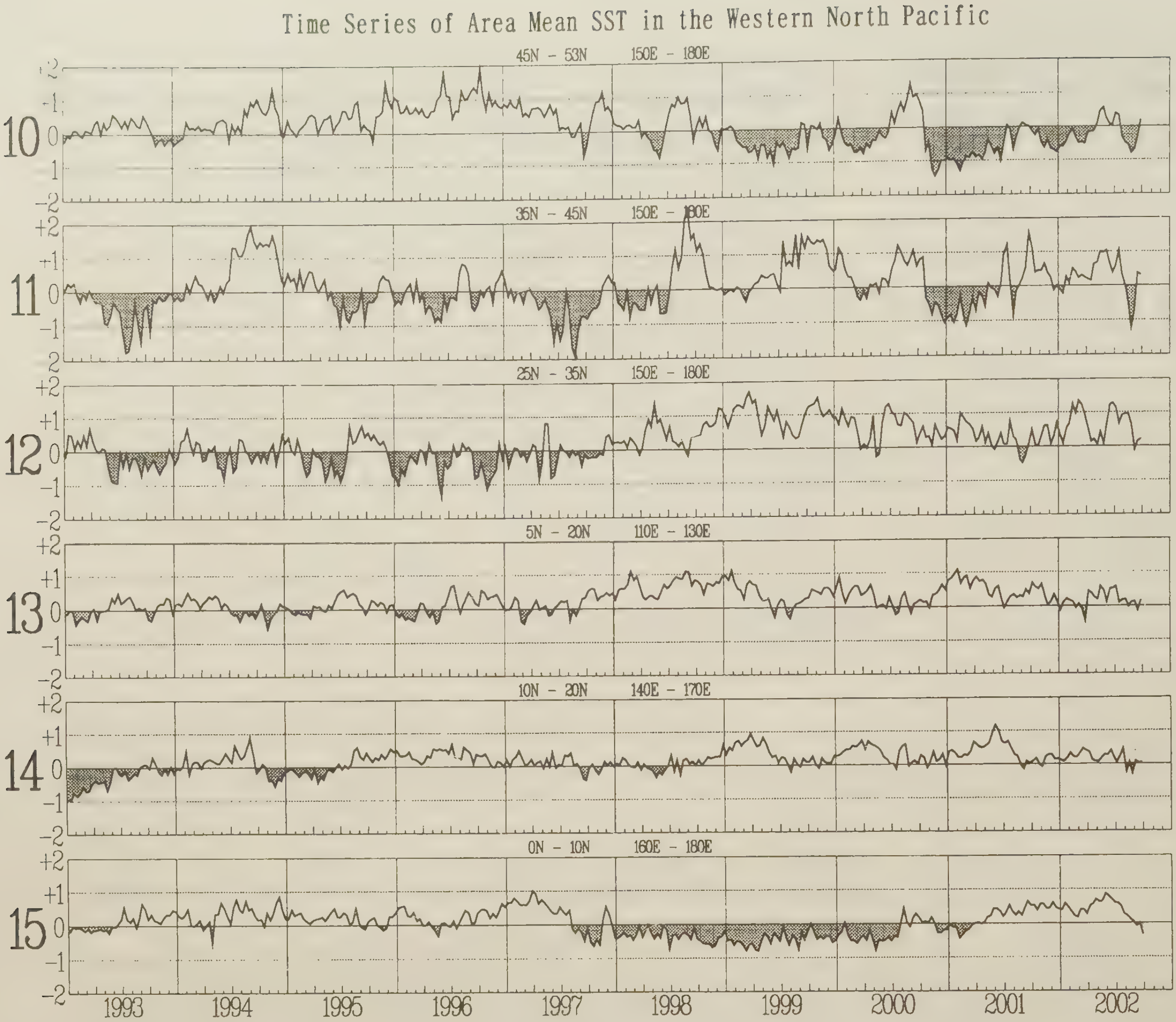
Fig. 12　Vertical cross section of monthly mean temperature along 165°E for September 2002. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)

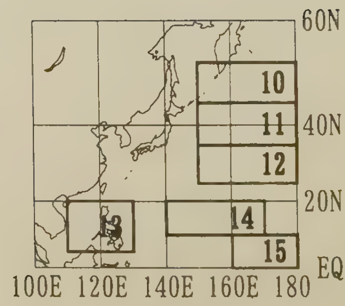




第13図　海域別旬平均海面水温平年偏差時系列図

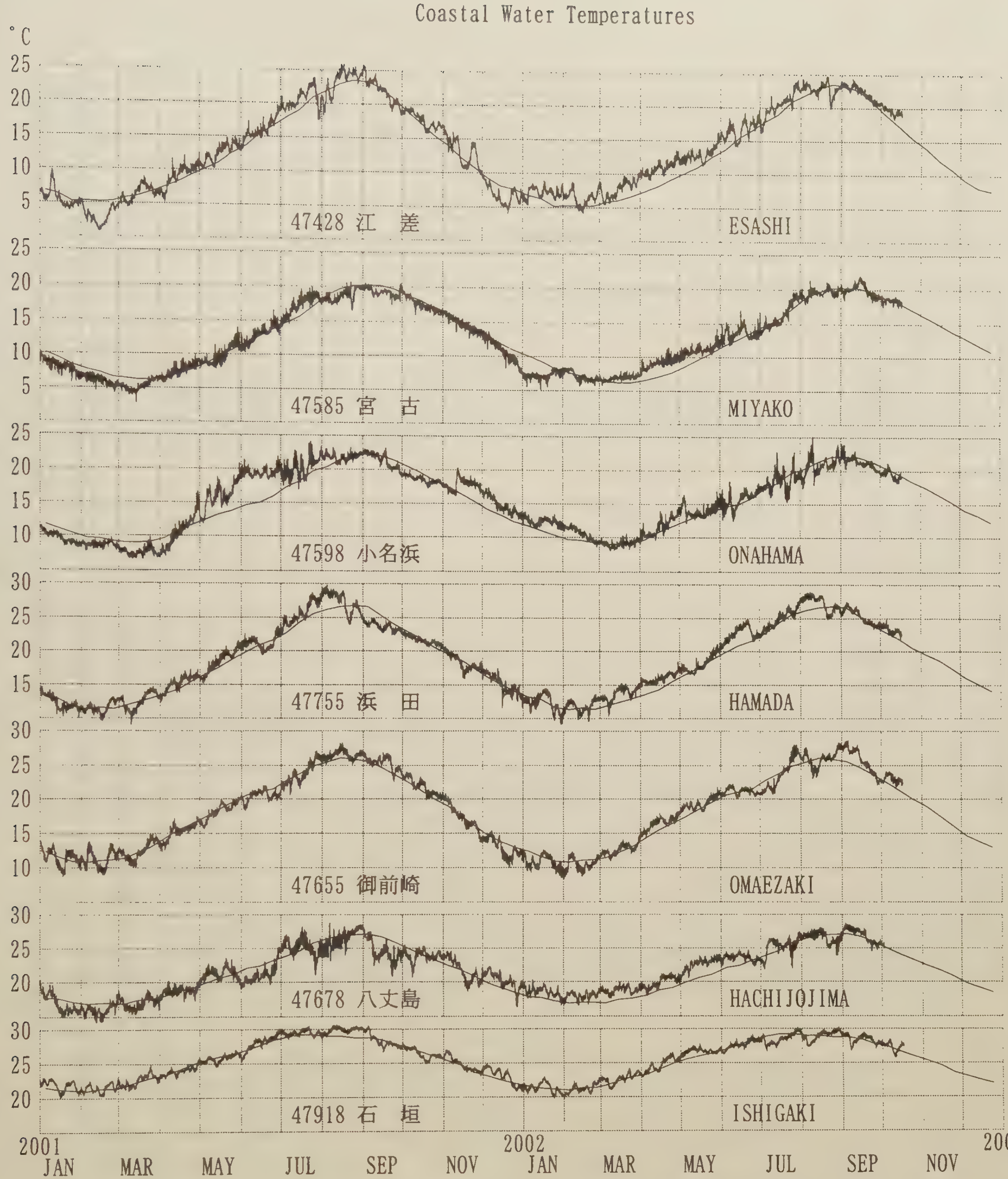
Fig. 13 Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

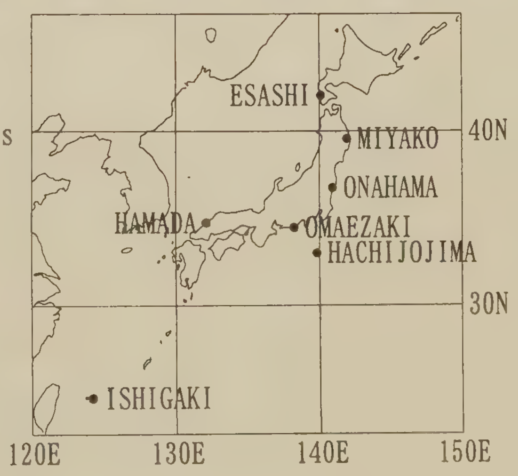




第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).

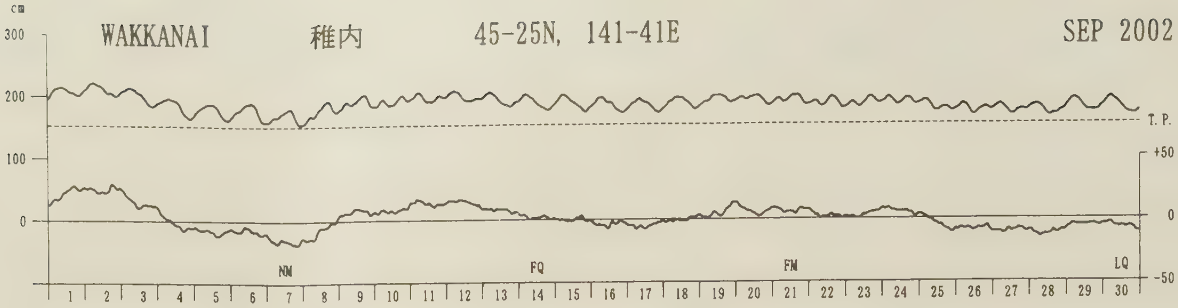


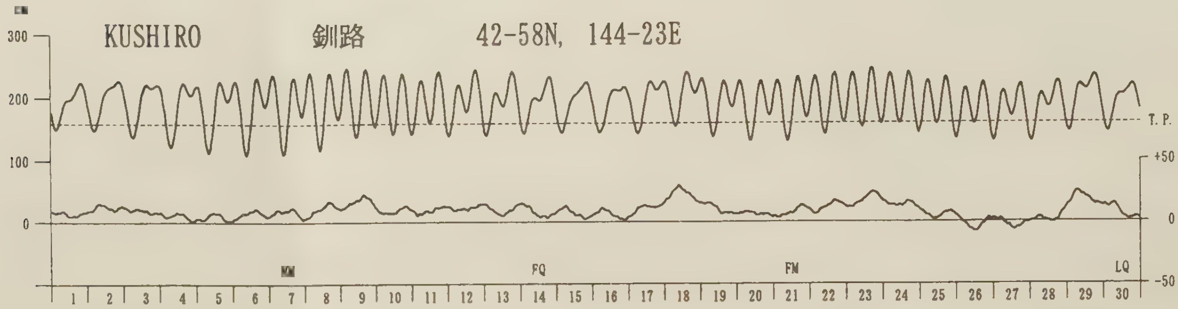


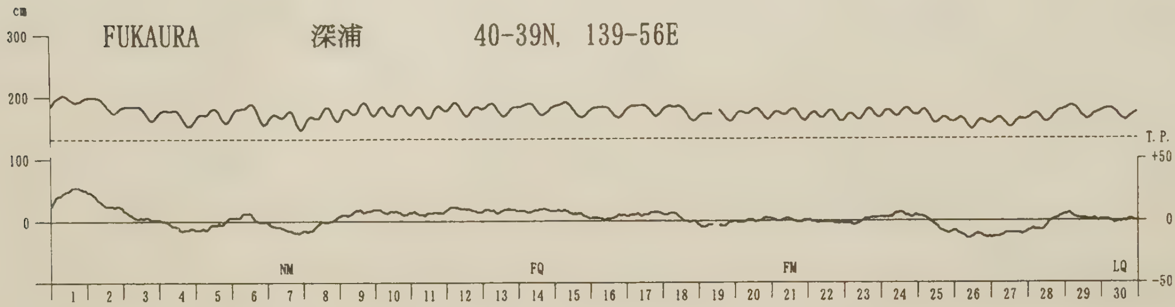
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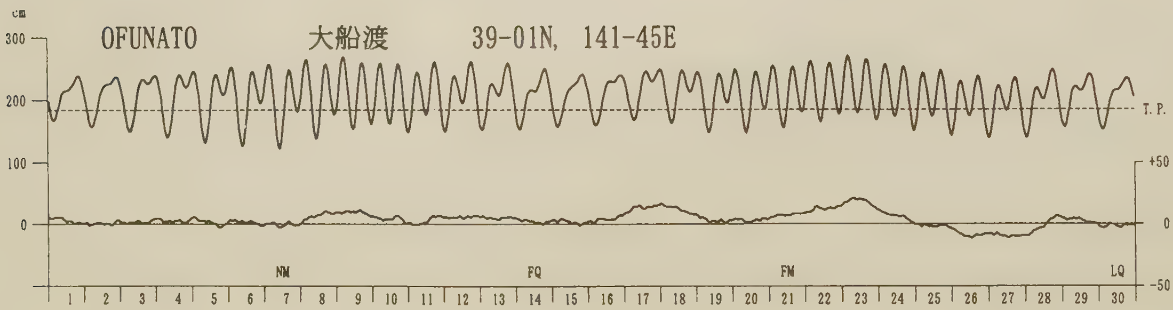
Fig. 14 Time series of hourly coastal water temperatures (°C) measured at 7 coastal stations of the JMA shown in the right panel.
Thin lines show ten-day mean climatology.

Time Series of Sea Level









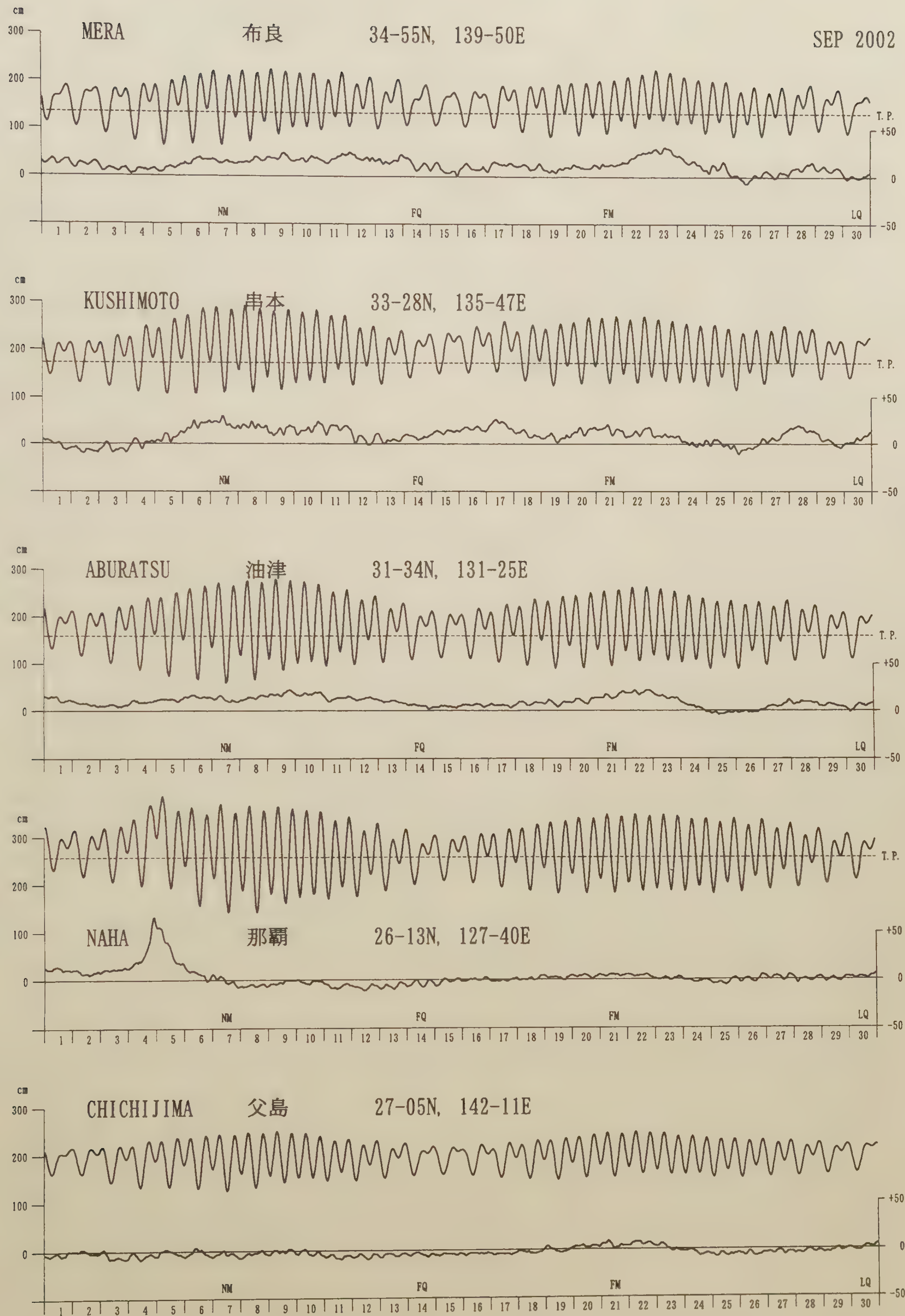
第15図 沿岸潮位時系列図 (2002年 9月)

Fig. 15 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.



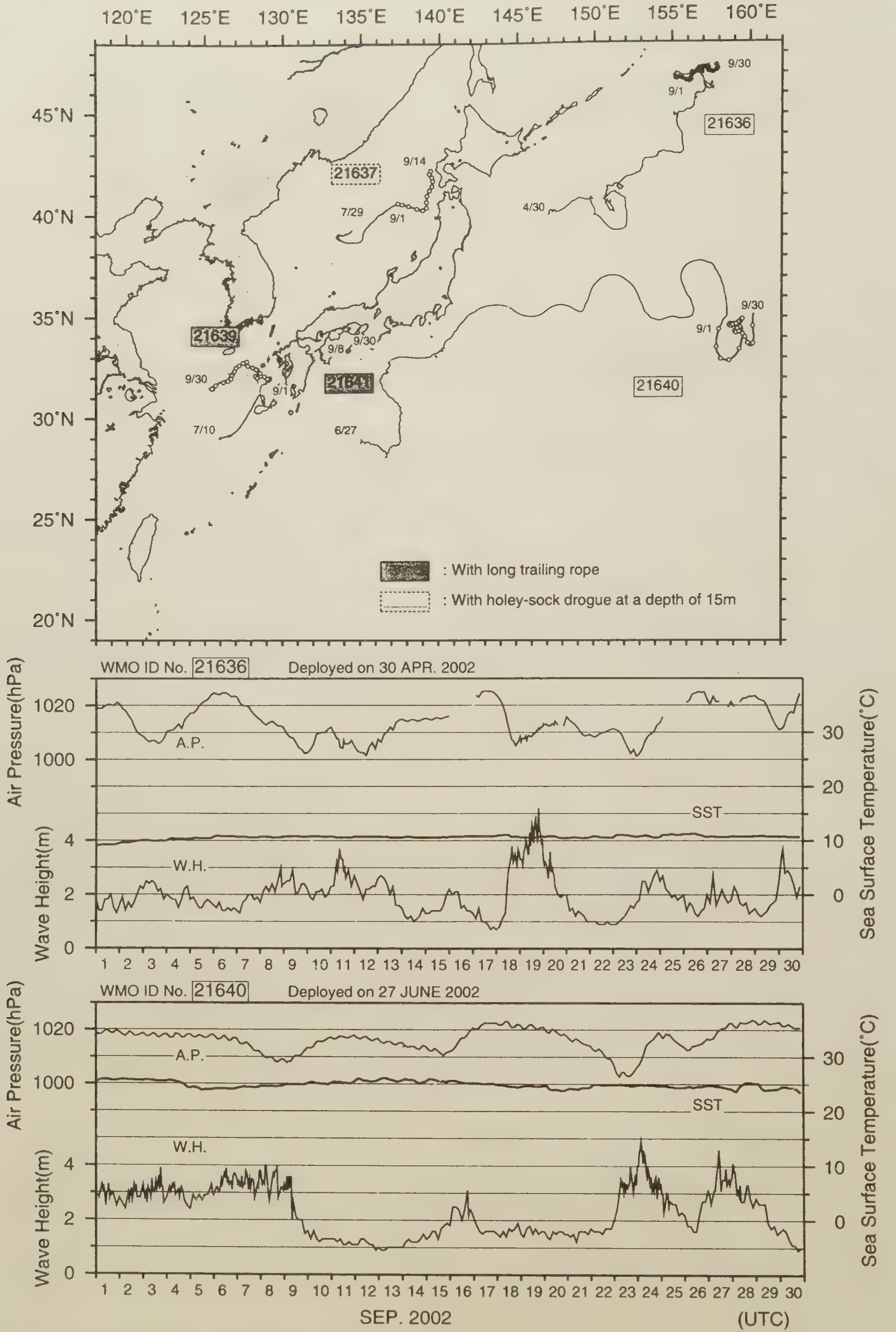
NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)

Time series of Sea Level



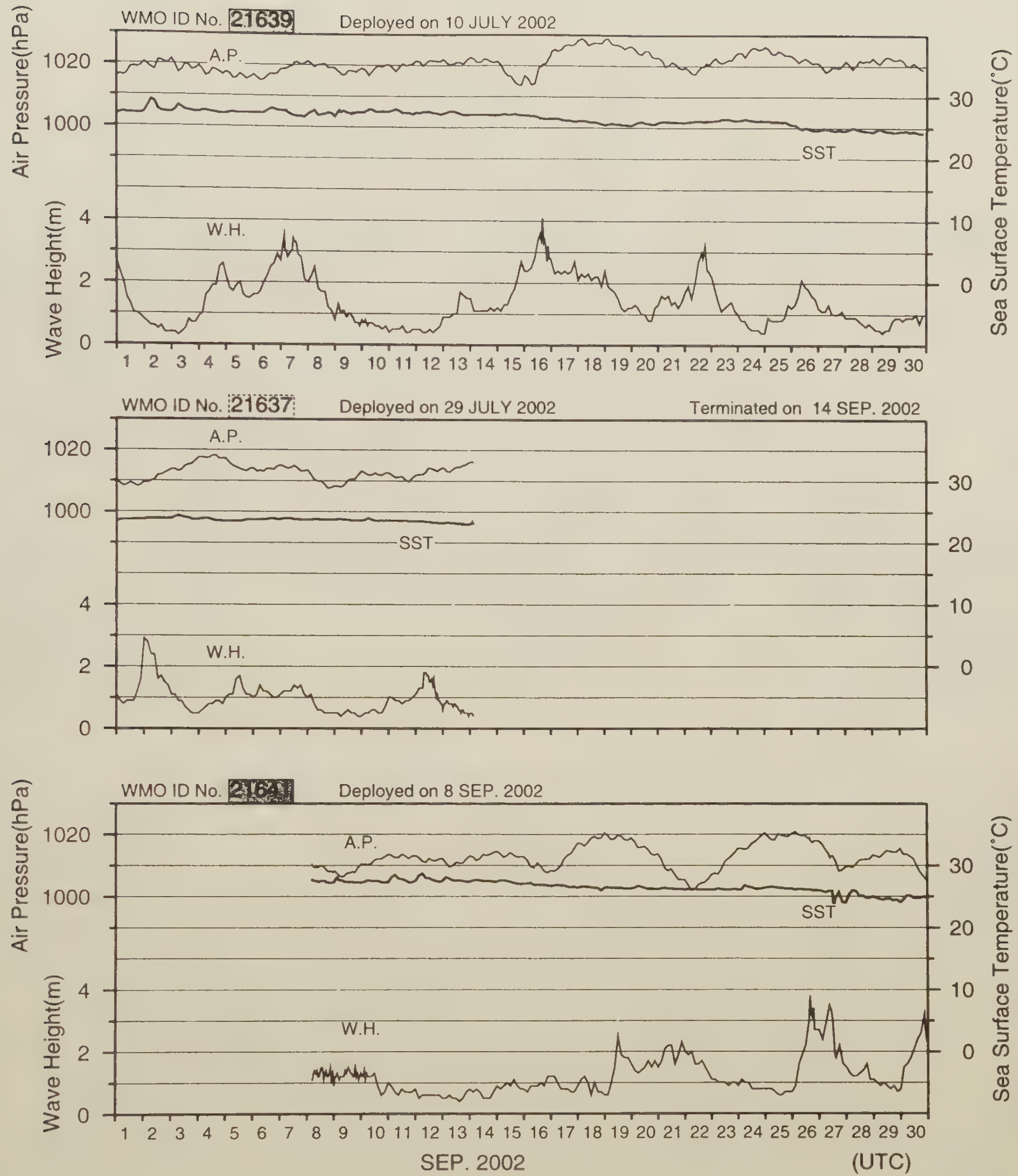
第15図 つづき

Fig. 15 continue



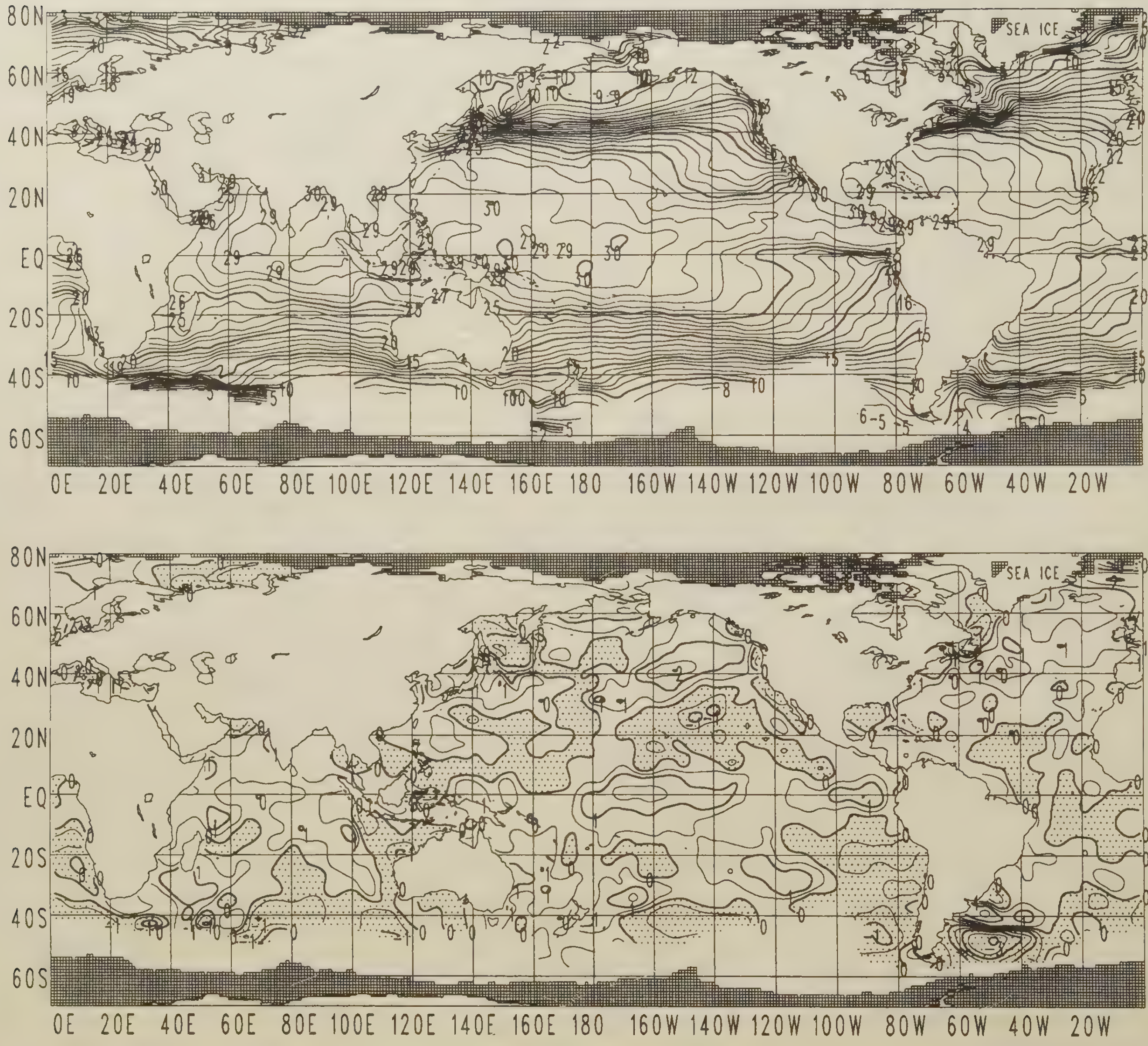
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Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.



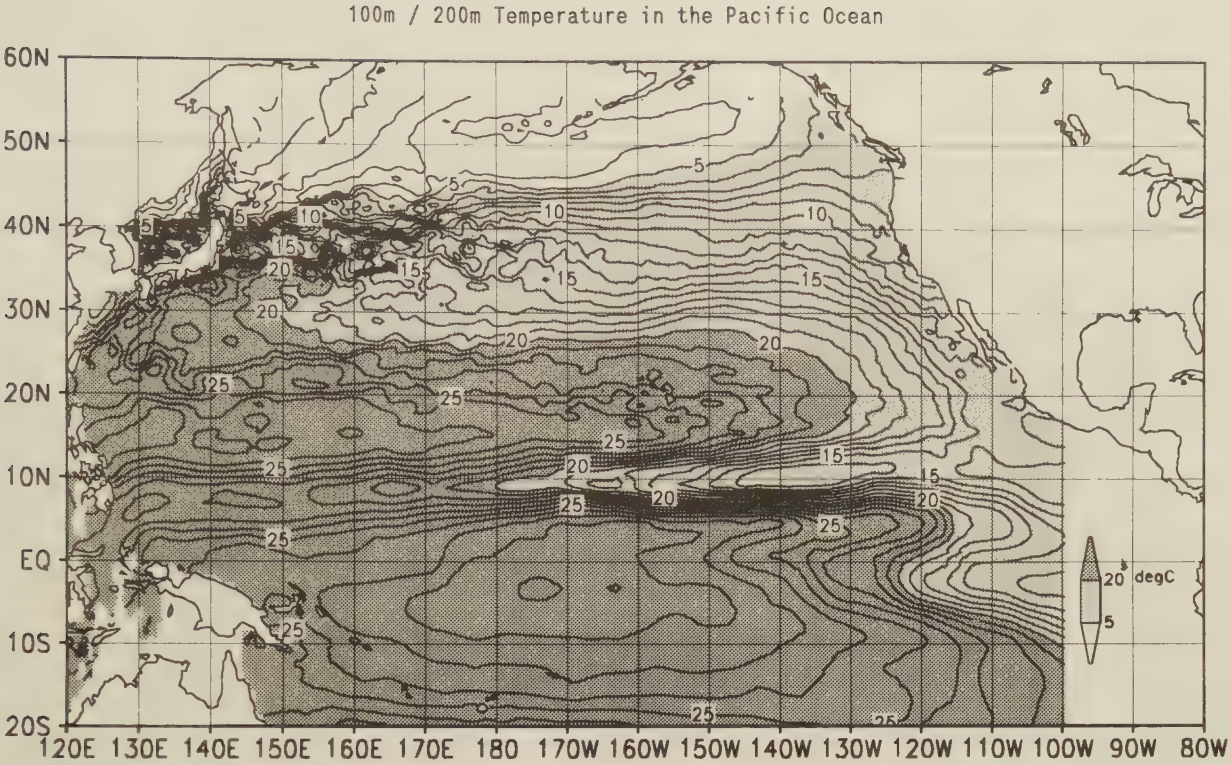
第16図 つづき
Fig.16 continue

SST & Anomalies in the Global Ocean



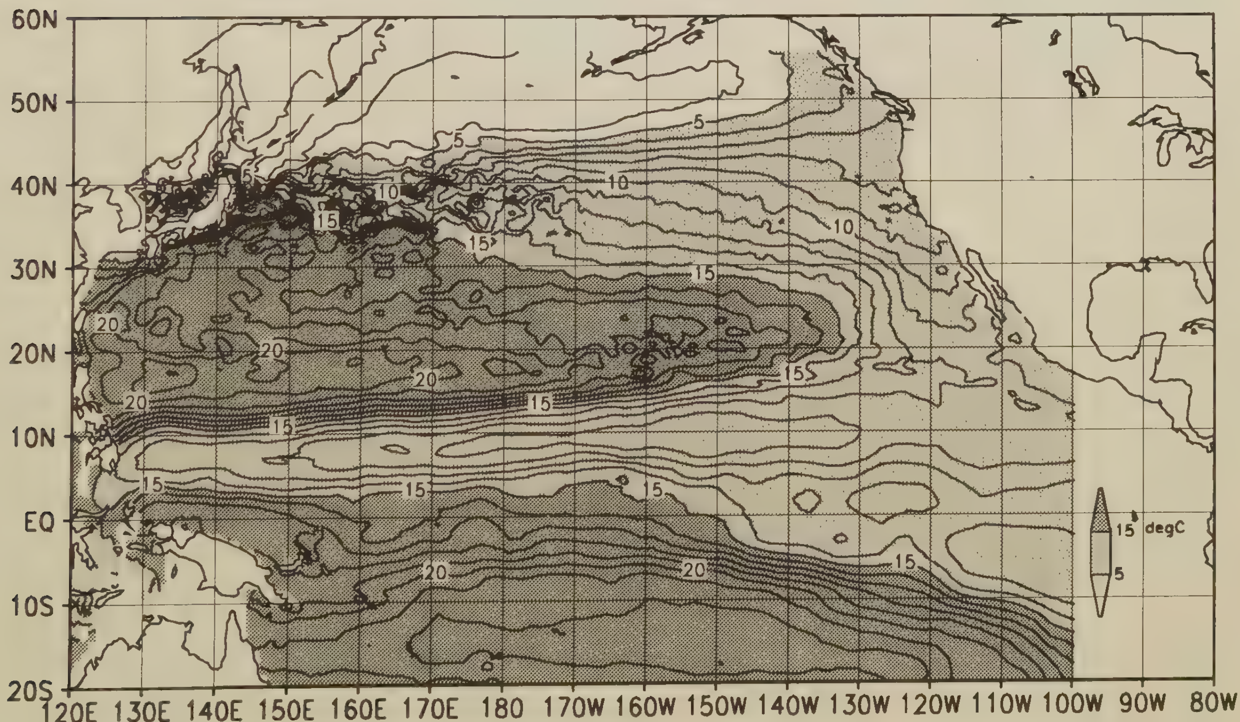
第17図　全球月平均海面水温図（上）及び偏差図（下）（2002年 9月）

Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for SEP 2002. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).



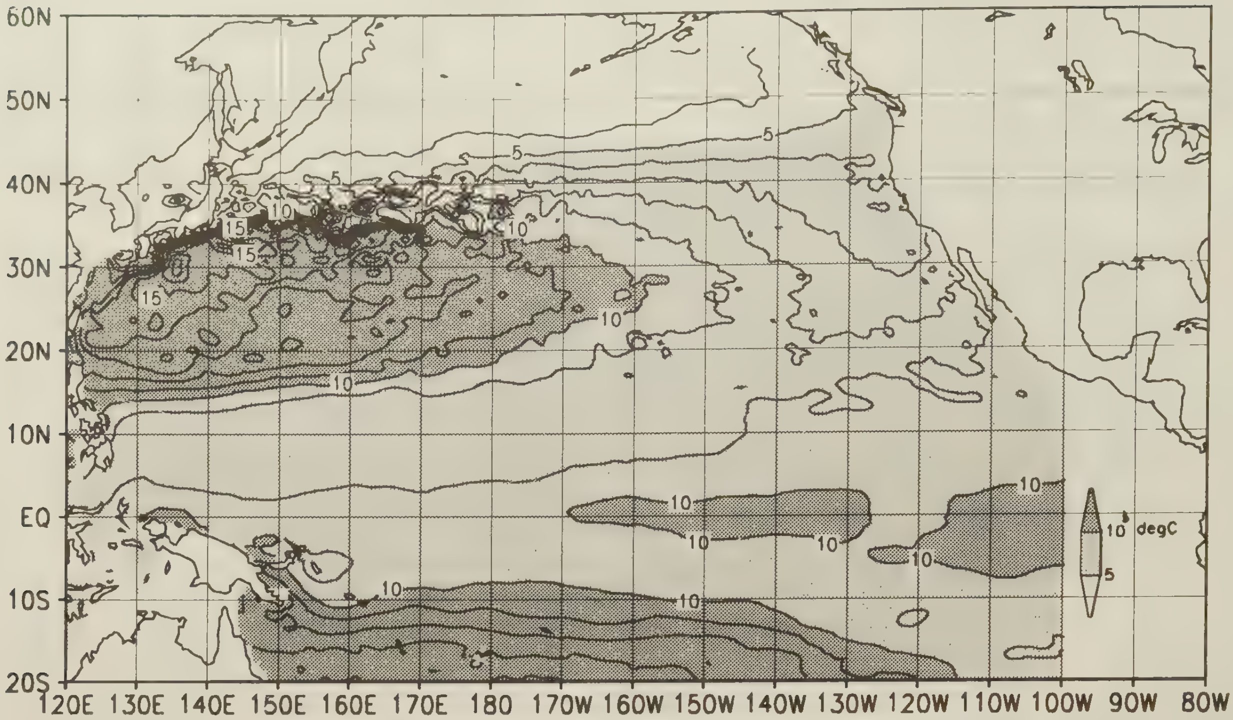
第 18 図　太平洋月平均表層水温図（深さ 100 m）　(2002 年 9 月)
（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for September 2002. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



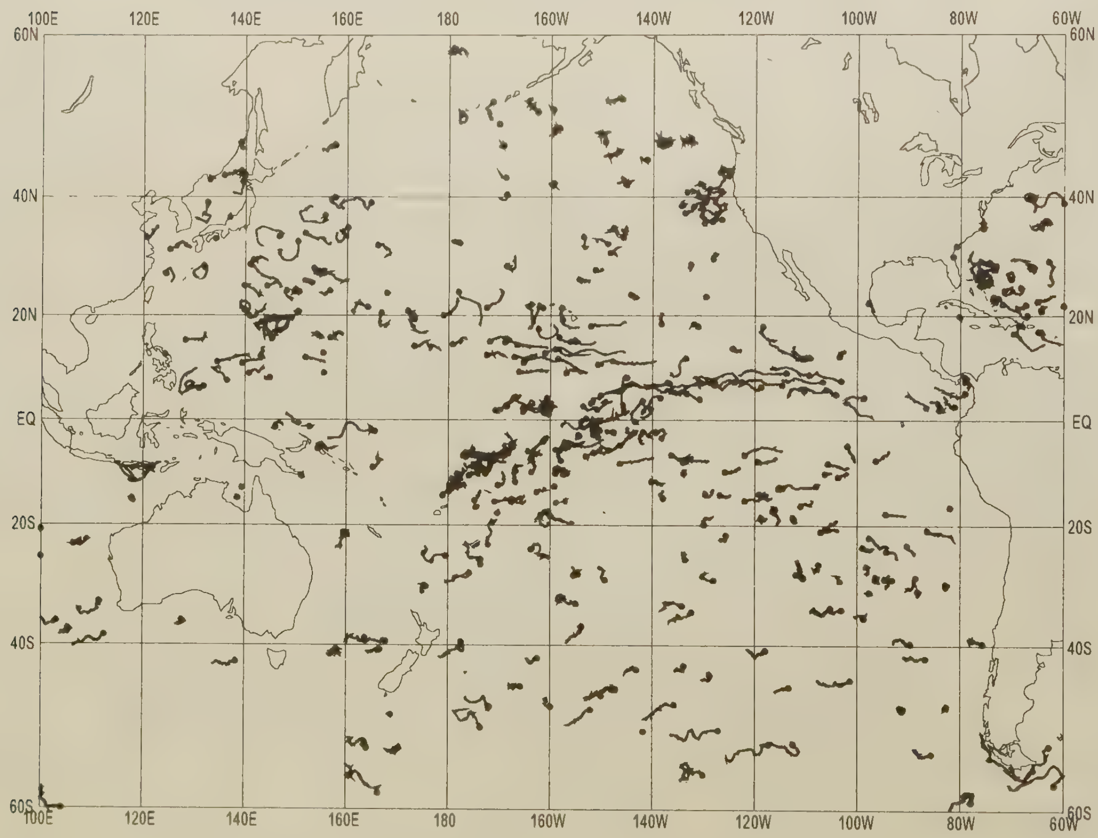
第 19 図　太平洋月平均表層水温図（深さ 200 m）　(2002 年 9 月)
（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for September 2002. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 20 図　太平洋月平均表層水温図（深さ 400 m）（2002 年 9 月）
（海洋総合解析システムによる）

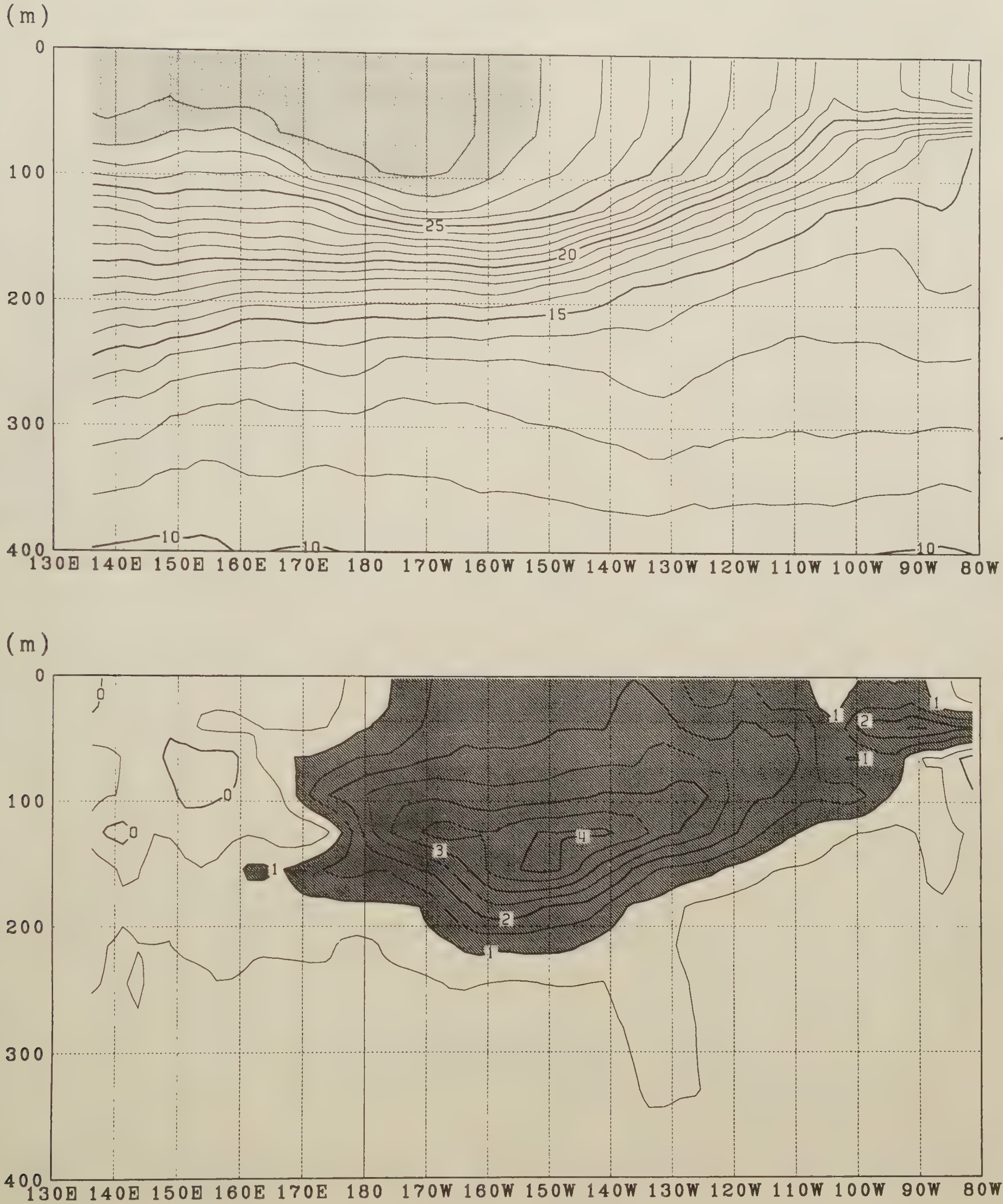
Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for September 2002. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



第 21 図　太平洋ブイ流跡図（2002 年 9 月）

Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during September 2002. Each track is for one buoy. Small circles represent the last positions for the month.

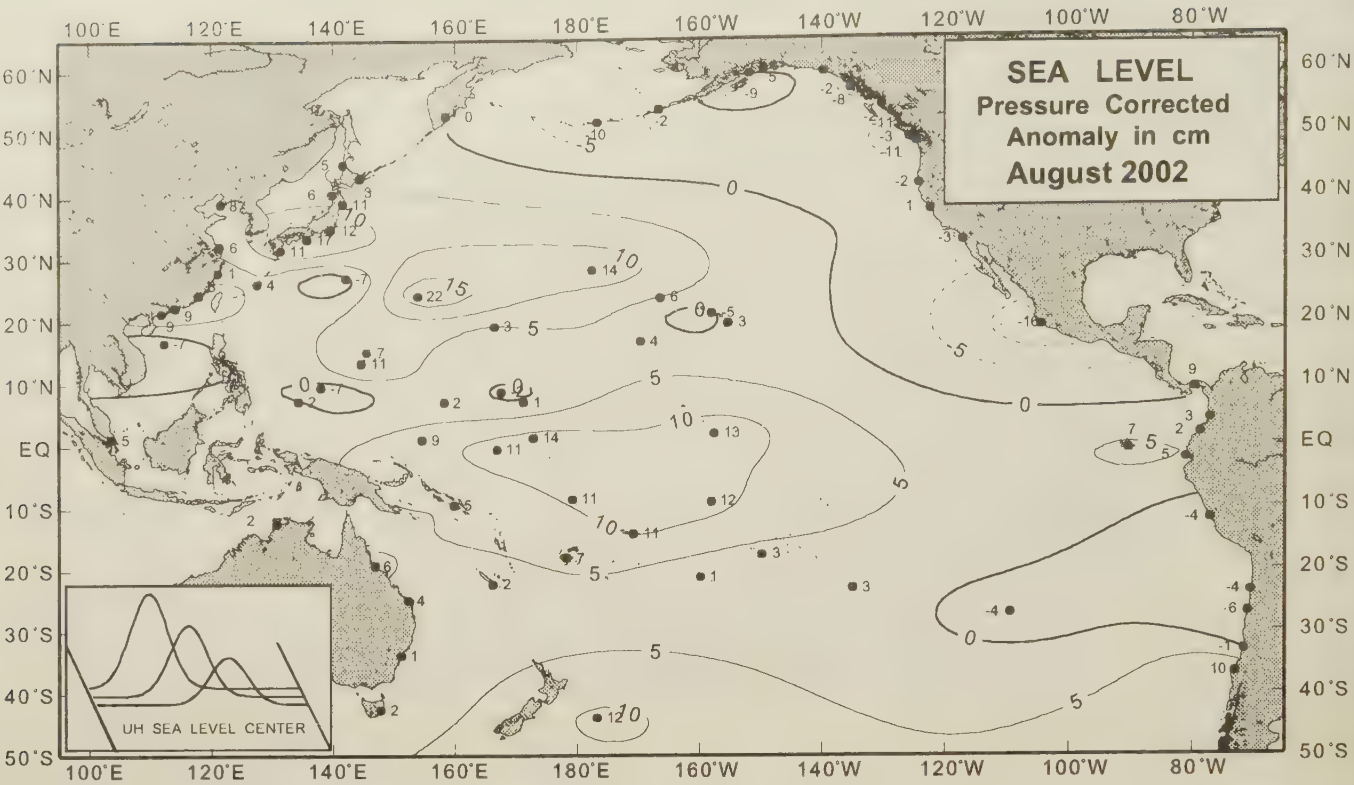
Depth-Longitude Sections of Equatorial Temperature & Anomalies



第22図　太平洋赤道に沿う表層水温（上）及び偏差（下）の深度－経度断面図（2002年 9月）

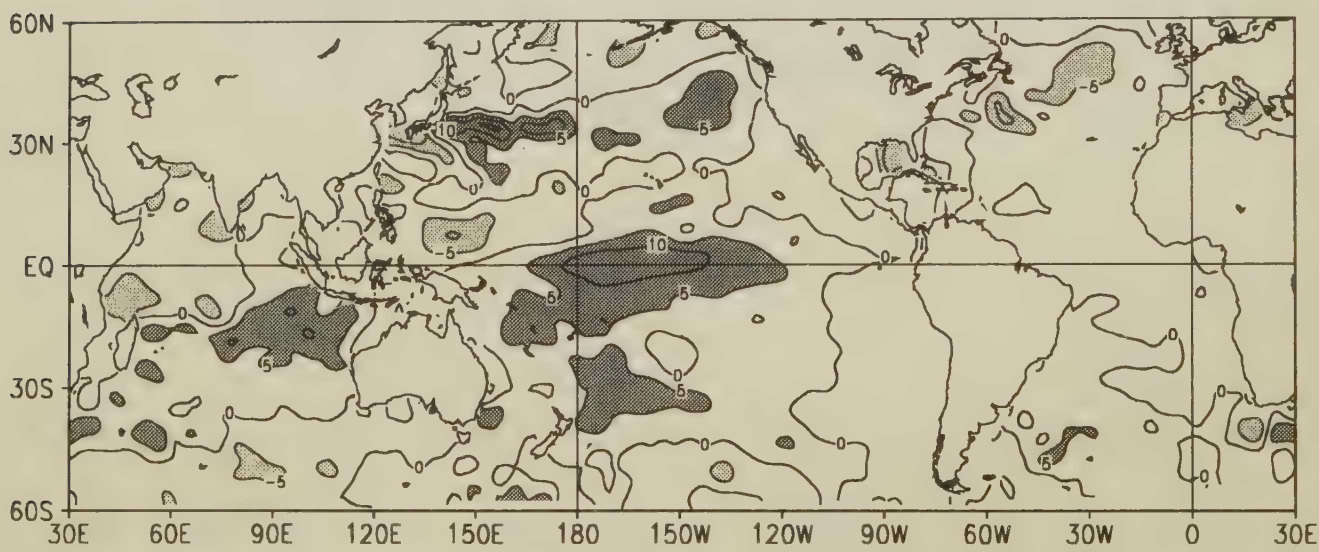
Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for SEP 2002. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-2001 base period means.

Sea Level Anomalies / Sea Surface Height Anomalies



第 23 図　太平洋月平均海面水位偏差図 （2002 年 8 月）

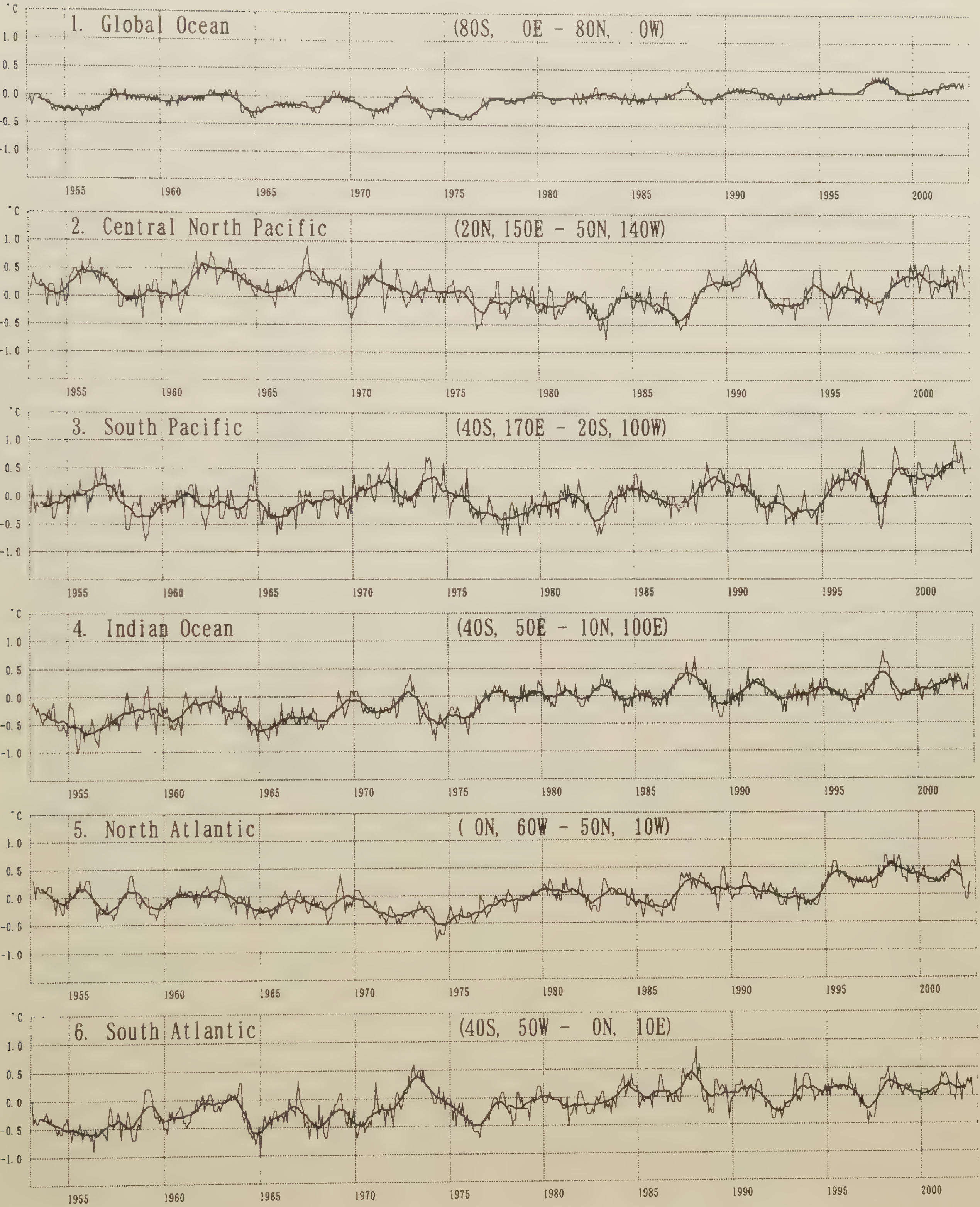
Fig. 23　Monthly sea level anomalies for August 2002 obtained from mean sea level (1975-1995) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 24 図　全球月平均海面高度偏差図 （2002 年 8 月）

Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of Jason-1 for August 2002. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

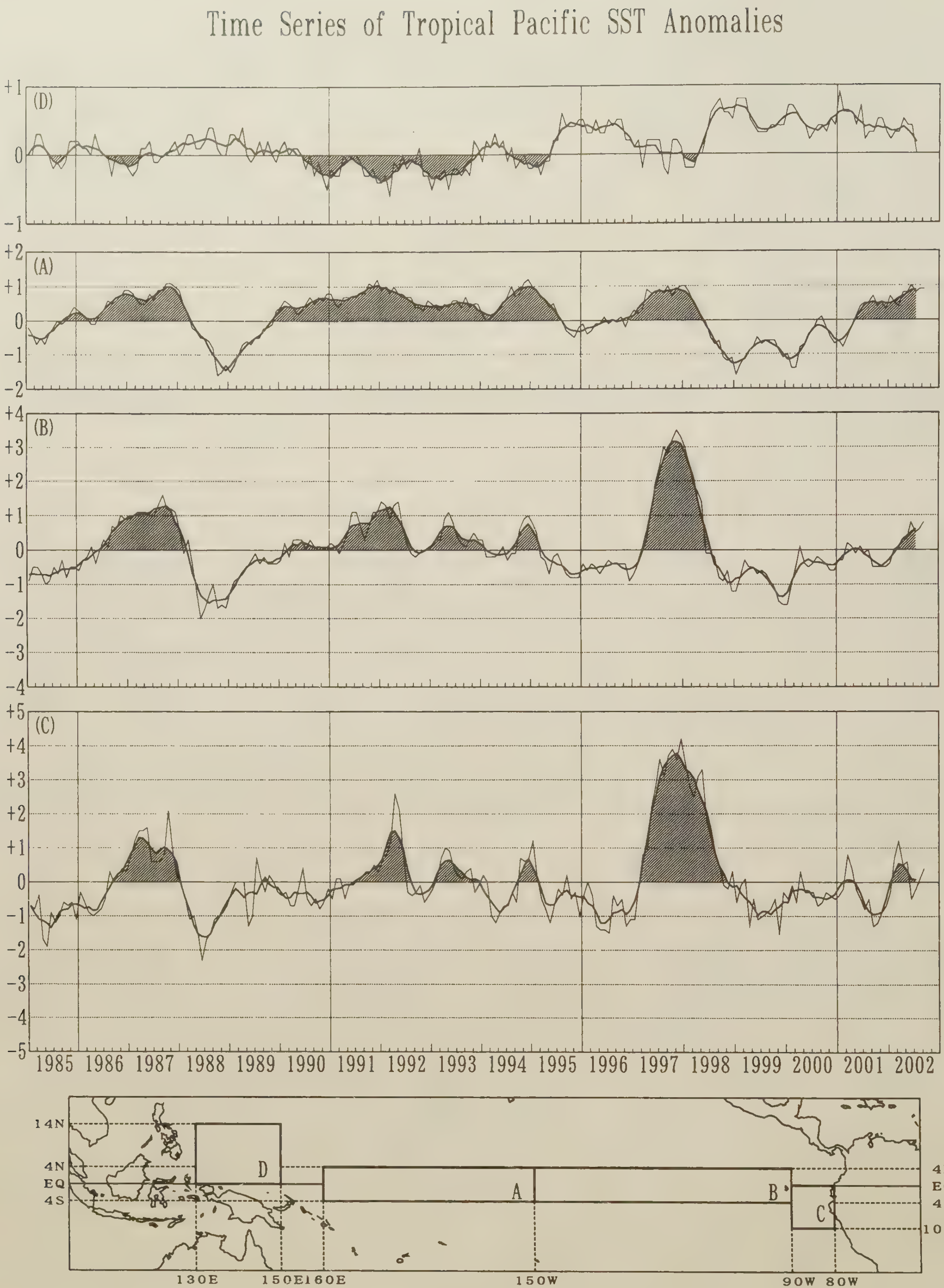
Long-term Variation of Monthly Mean SST Anomalies



第25図 海域平均海面水温偏差の長期変動



Fig. 25 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.



第26図　太平洋熱帯域の海面水温偏差時系列図

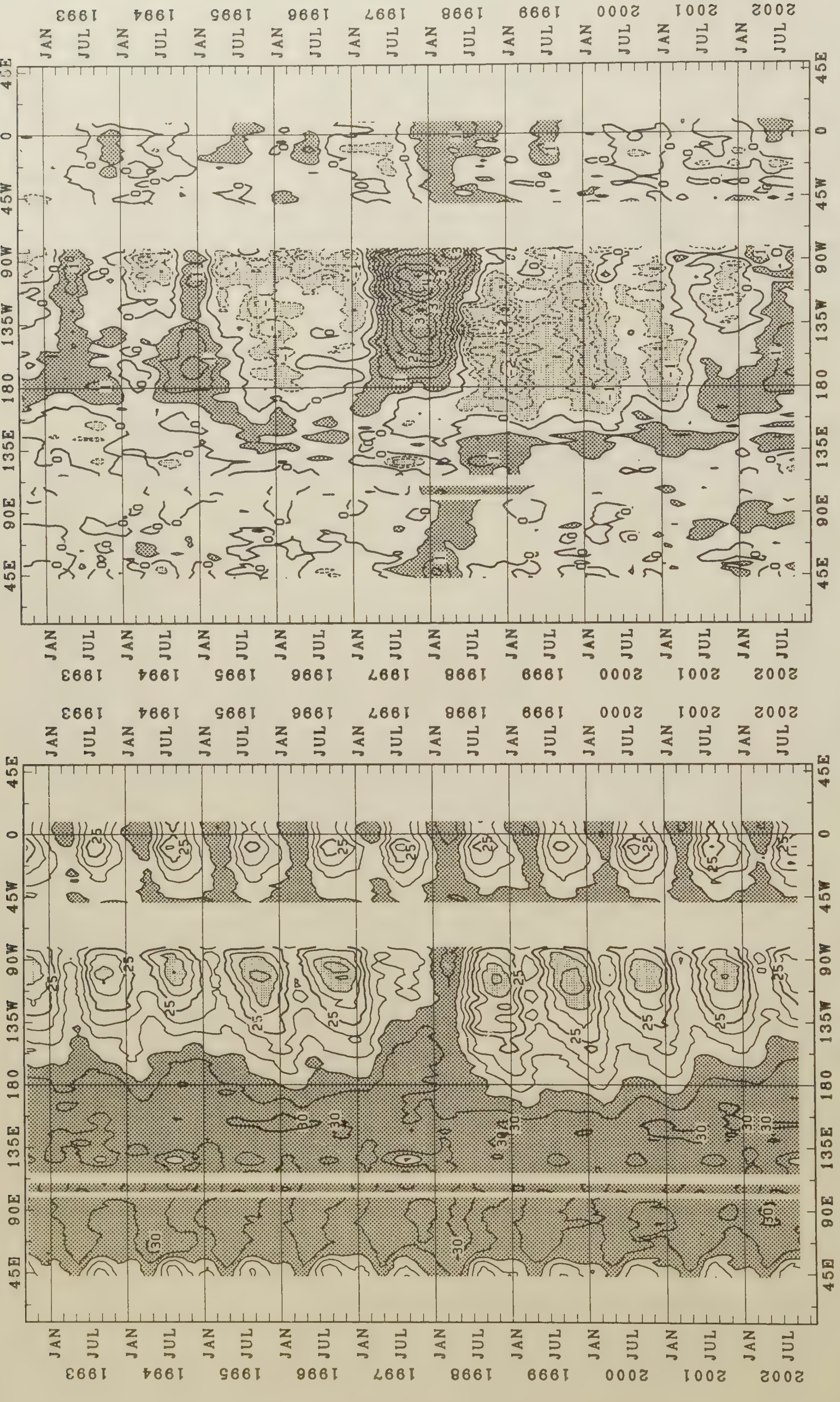
Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

Monitoring Indices in the Tropical Pacific

MONTH YEAR	SEA SURFACE TEMPERATURE AND ANOMALY (°C) REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	SEA LEVEL PRESSURE ANOMALY (hPa) TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 00	29.2	0.7	27.0	-1.0	23.8	-1.6	24.0	-0.5	0.5	1.2	0.1
FEB 00	29.0	0.7	26.6	-1.4	25.3	-1.0	25.9	-0.1	1.1	2.6	-0.3
MAR 00	29.1	0.6	26.7	-1.4	26.6	-0.5	25.7	-0.6	1.1	1.6	-0.6
APR 00	29.3	0.5	27.4	-0.8	27.3	0.1	25.7	0.3	1.3	1.0	-1.1
MAY 00	29.7	0.4	27.9	-0.7	26.5	-0.4	24.0	-0.3	0.3	0.8	0.4
JUN 00	29.6	0.2	28.1	-0.4	25.7	-0.5	22.6	-0.3	-0.3	0.3	0.8
JUL 00	29.6	0.3	28.2	-0.3	25.0	-0.4	21.6	-0.3	-0.3	-0.5	0.0
AUG 00	29.6	0.4	28.4	0.0	24.5	-0.2	20.2	-0.7	0.6	0.2	-0.9
SEP 00	29.7	0.4	28.5	0.1	24.4	-0.3	19.9	-0.6	0.9	1.5	-0.2
OCT 00	29.7	0.3	28.2	-0.2	24.3	-0.4	20.6	-0.3	1.0	0.3	-1.5
NOV 00	29.8	0.5	27.9	-0.5	24.1	-0.6	21.4	-0.4	1.8	1.2	-2.3
DEC 00	29.4	0.4	27.5	-0.7	24.4	-0.6	22.4	-0.5	0.9	-0.9	-2.6
JAN 01	29.4	0.9	27.4	-0.6	25.1	-0.3	24.1	-0.4	0.8	2.5	0.6
FEB 01	28.9	0.6	27.2	-0.8	26.0	-0.3	25.8	-0.2	1.0	-0.4	-3.2
MAR 01	29.1	0.6	27.6	-0.5	27.3	0.2	27.1	0.8	0.8	1.3	-0.2
APR 01	29.4	0.6	28.0	-0.2	27.3	0.1	25.8	0.4	0.1	-0.1	-0.3
MAY 01	29.7	0.4	28.7	0.1	26.8	-0.1	24.1	-0.2	-0.7	-0.2	0.9
JUN 01	30.1	0.7	28.9	0.4	26.3	0.1	22.4	-0.5	0.2	-0.2	-0.5
JUL 01	29.5	0.2	29.0	0.5	25.3	-0.1	21.1	-0.8	-0.2	-0.1	0.3
AUG 01	29.5	0.3	28.9	0.5	24.7	0.0	20.4	-0.5	-0.7	-0.9	0.1
SEP 01	29.6	0.3	29.1	0.7	24.2	-0.5	19.2	-1.3	0.1	-0.2	-0.4
OCT 01	29.9	0.5	28.8	0.4	24.2	-0.5	19.7	-1.2	-0.1	-0.9	-0.9
NOV 01	29.8	0.5	28.9	0.5	24.2	-0.5	20.9	-0.9	0.6	0.7	-0.4
DEC 01	29.3	0.3	28.5	0.3	24.5	-0.5	22.2	-0.7	-0.8	-1.2	0.3
JAN 02	28.7	0.2	28.7	0.7	25.0	-0.4	24.2	-0.3	0.3	1.3	0.7
FEB 02	28.6	0.3	28.5	0.5	26.3	0.0	26.7	0.7	0.7	1.5	-0.2
MAR 02	28.8	0.3	28.5	0.4	27.2	0.1	27.5	1.2	-0.2	0.4	1.0
APR 02	29.3	0.5	29.0	0.8	27.5	0.3	25.9	0.5	-0.1	0.1	0.3
MAY 02	29.7	0.4	29.4	0.8	27.2	0.3	24.9	0.6	-1.3	-1.1	0.7
JUN 02	29.8	0.4	29.5	1.0	27.0	0.8	22.4	-0.5	-0.4	-0.2	0.4
JUL 02	29.3	0.0	29.3	0.8	25.9	0.5	21.7	-0.2	-0.7	0.5	1.6
AUG 02	29.2	0.0	29.3	0.9	25.3	0.6	21.0	0.1	-1.2	-1.4	0.5
SEP 02	29.3	0.0	29.3	0.9	25.5	0.8	20.9	0.4	-0.5	-0.3	0.8

第1表　太平洋熱帯域の大気及び海洋の監視指数

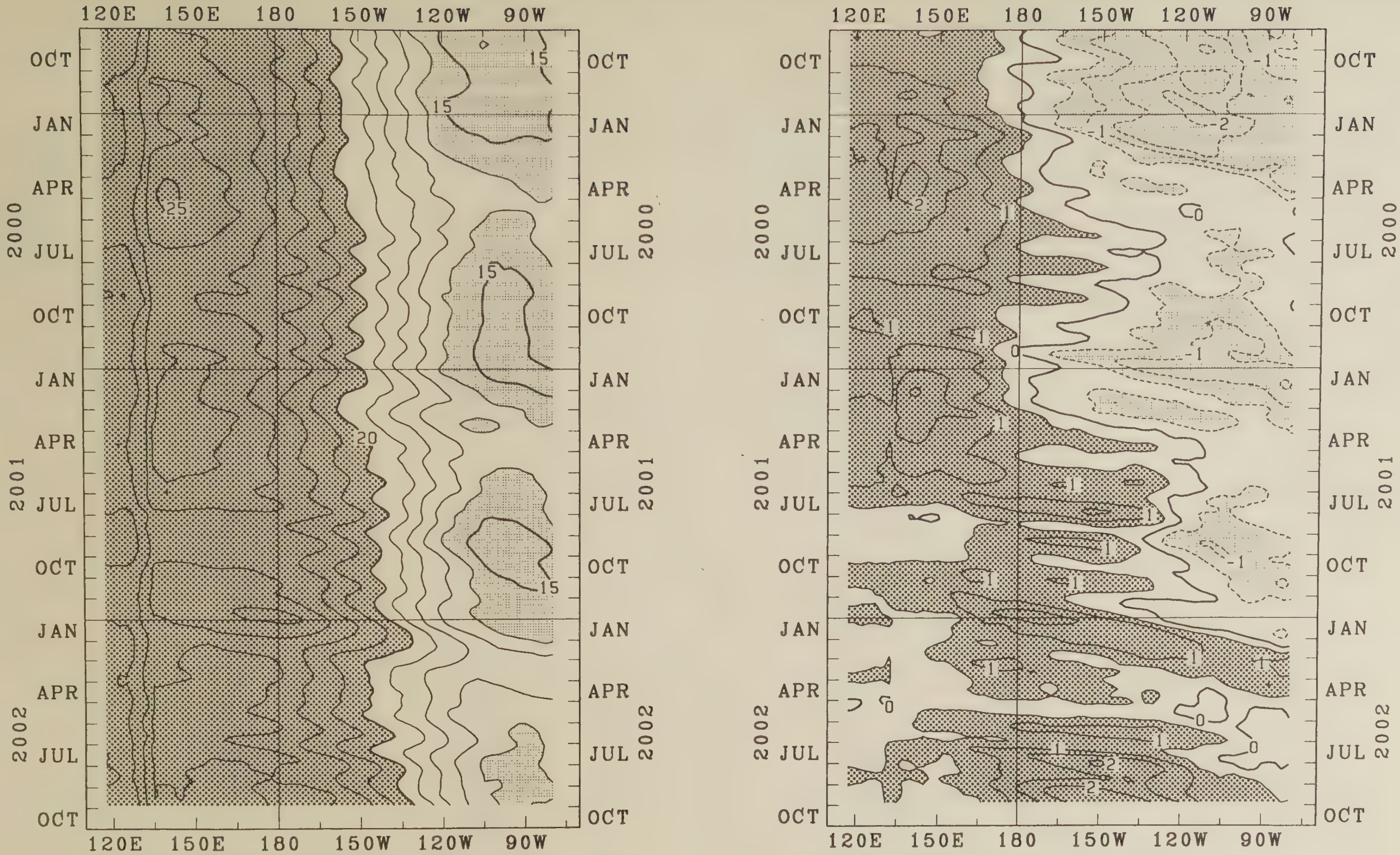
Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



第 27 図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

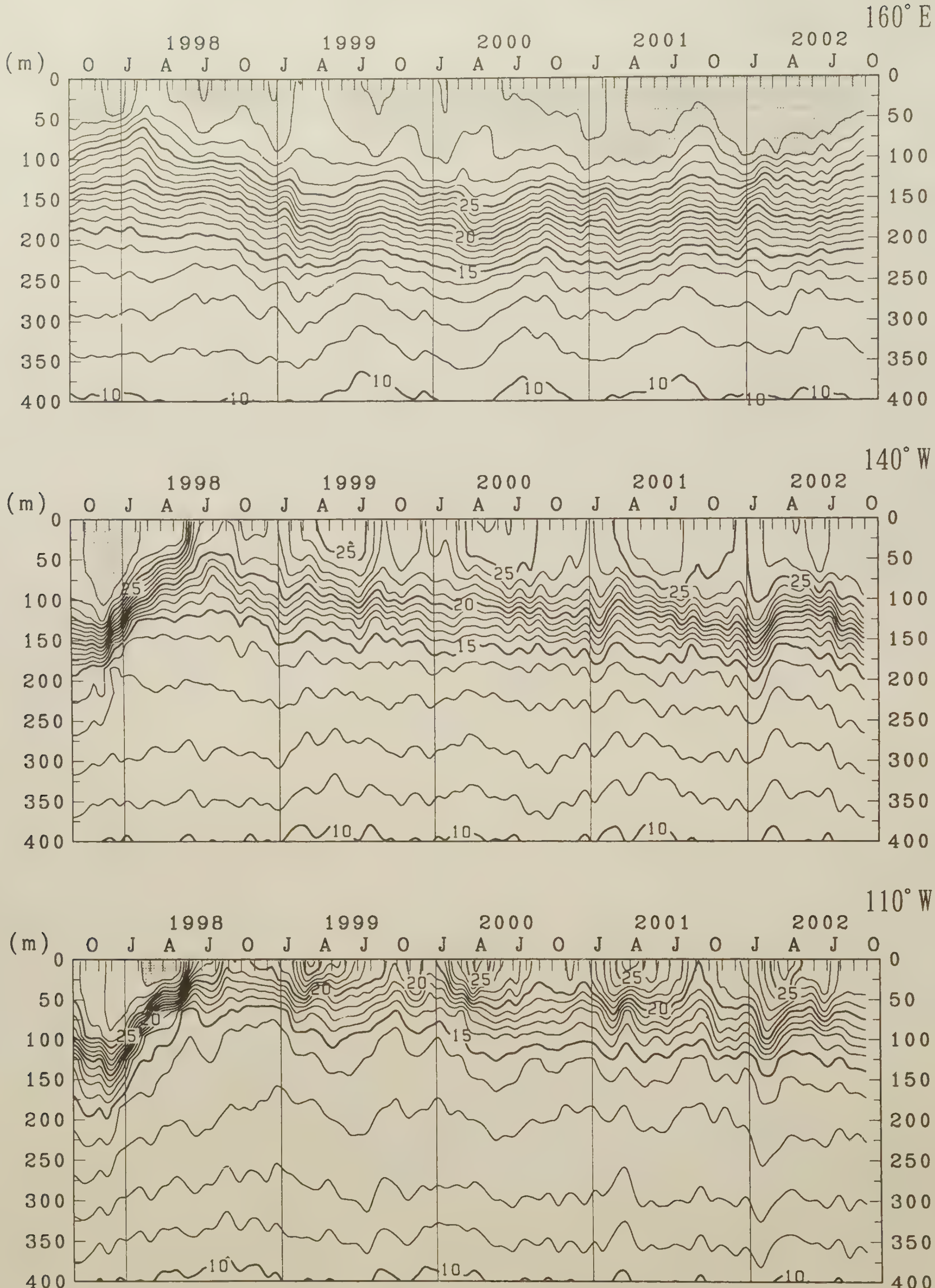
Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2˚N-2˚S) in the global ocean. Contour interval is 1˚C (left) and 0.5˚C (right). Values greater than 28˚C are shaded and values less than 23˚C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.

Time-Longitude Sections of Ocean Heat Content & Anomalies (Eq.)



第28図　太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig. 28 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-2001 base period means.



第29図　太平洋赤道域の表層水温の時間－深度断面図

（上：西部、中：中部、下：東部）

Fig. 29 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.

Sea Ice

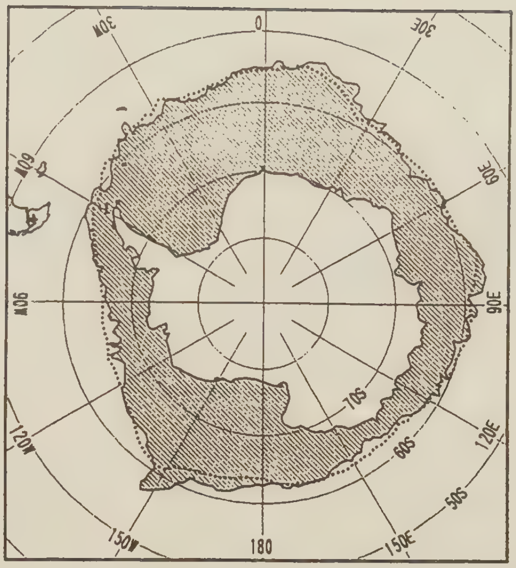


第30-1図　北極域の海氷図（2002年 9月13日）

Fig.30-1 Sea ice chart in the Arctic on 13 Sep. 2002.

The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.

The data source is the National Ice Center (USA).

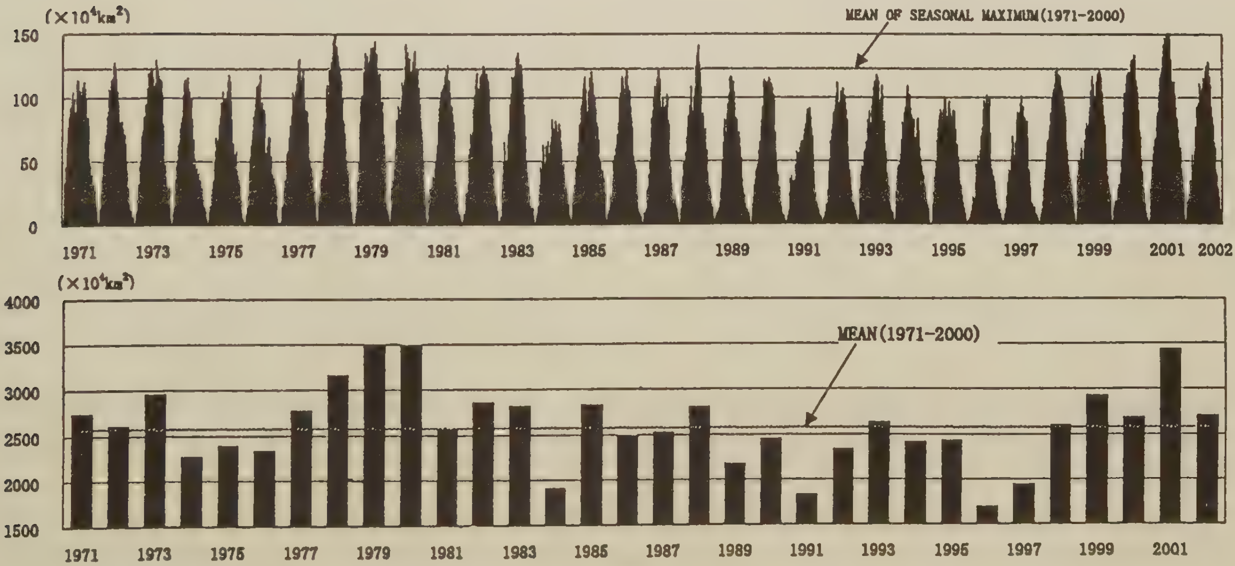


第30-2図　南極域の海氷図（2002年 9月13日）

Fig.30-2 Sea ice chart in the Antarctic on 13 Sep. 2002.

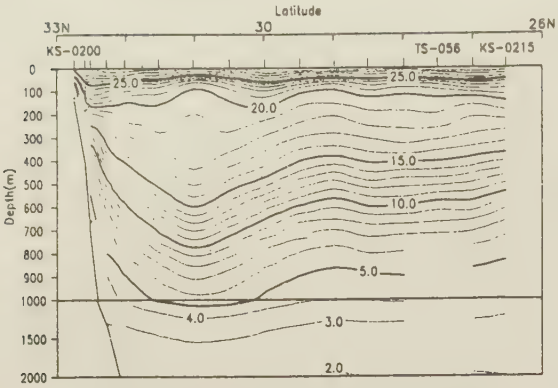
The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.

The data source is the National Ice Center (USA).

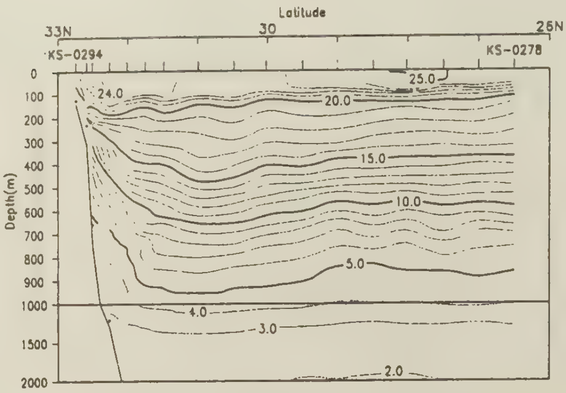


第30-3図 オホーツク海の海氷期の半旬海氷域面積（上段）とその積算（下段）の経年変化

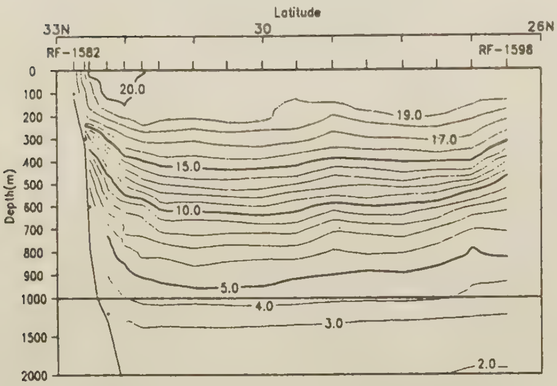
Fig.30-3 Time series of 5-day sea ice extent from December to May (upper) and its accumulation (lower) in the Sea of Okhotsk



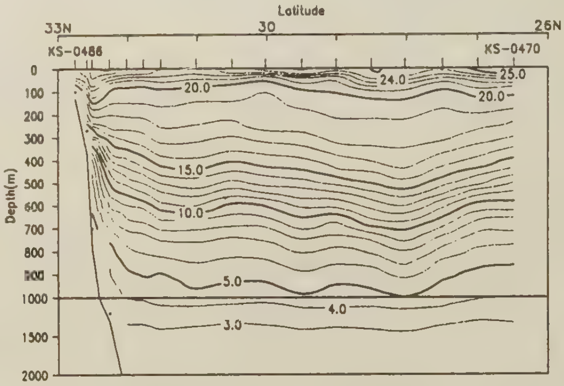
(a) August 2001 (Keifu Maru)



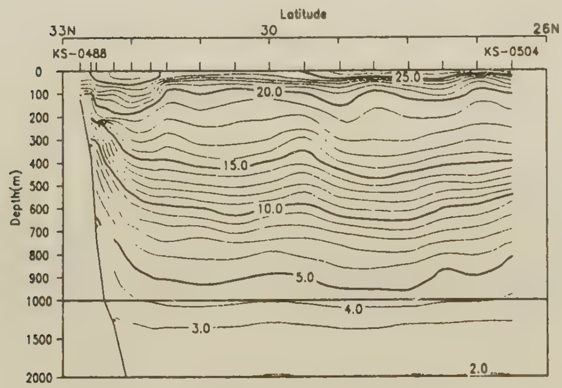
(b) December 2001 (Keifu Maru)



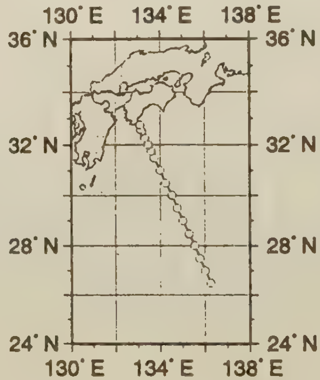
(c) February 2002 (Ryofu Maru)



(d) May 2002 (Keifu Maru)



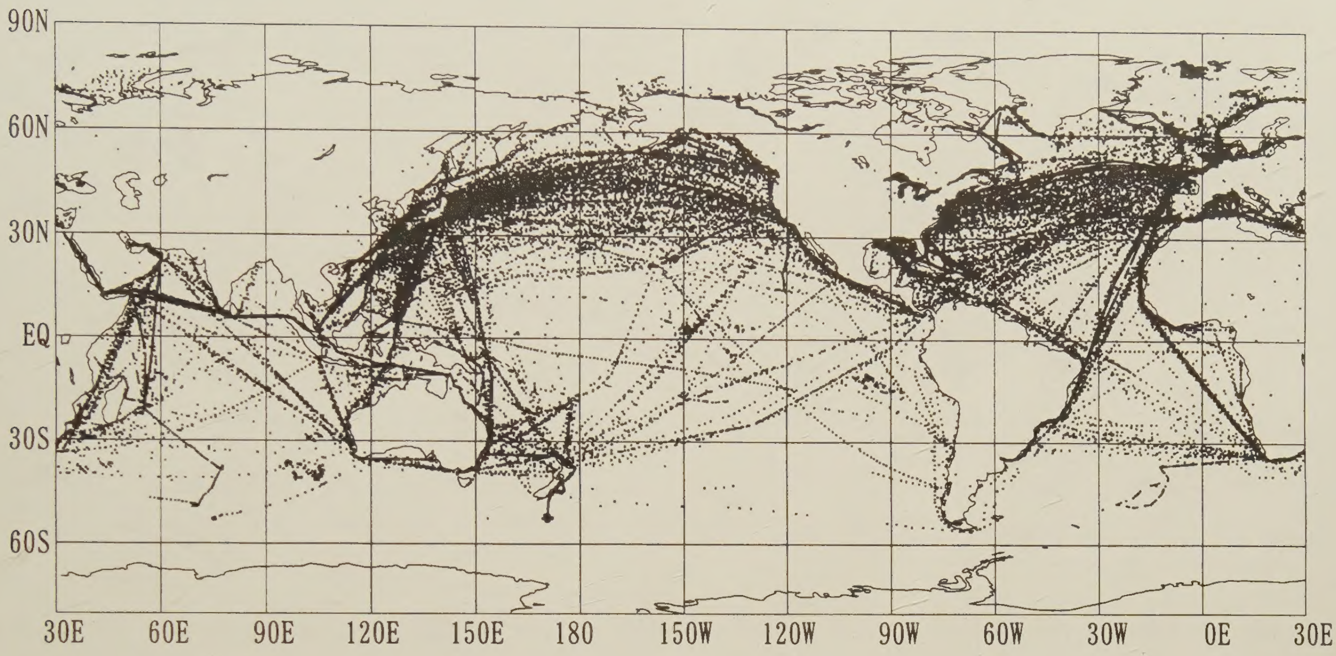
(e) June 2002 (Keifu Maru)



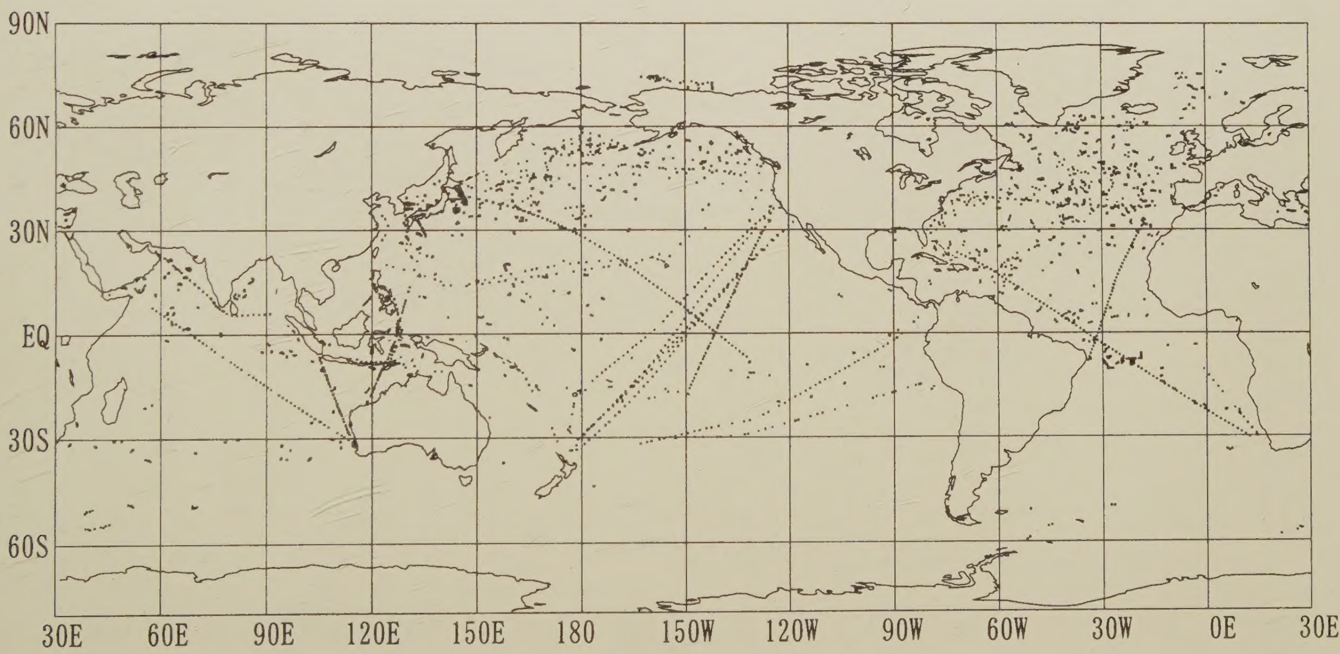
(f) Location of the ASUKA line

第31図 神戸海洋気象台啓風丸・気象庁凌風丸によるASUKA線に沿った水温鉛直断面図.(a) 2001年8月,(b) 2001年12月,(c) 2002年2月,(d) 2002年5月,(e) 2002年6月,(f) 観測位置図

Fig. 31 Vertical sections of water temperature (℃) along the ASUKA line observed by R/V Keifu Maru and R/V Ryofu Maru. (a) August 2001, (b) December 2001, (c) February 2002, (d) May 2002, (e) June 2002, (f) Location of the ASUKA line.



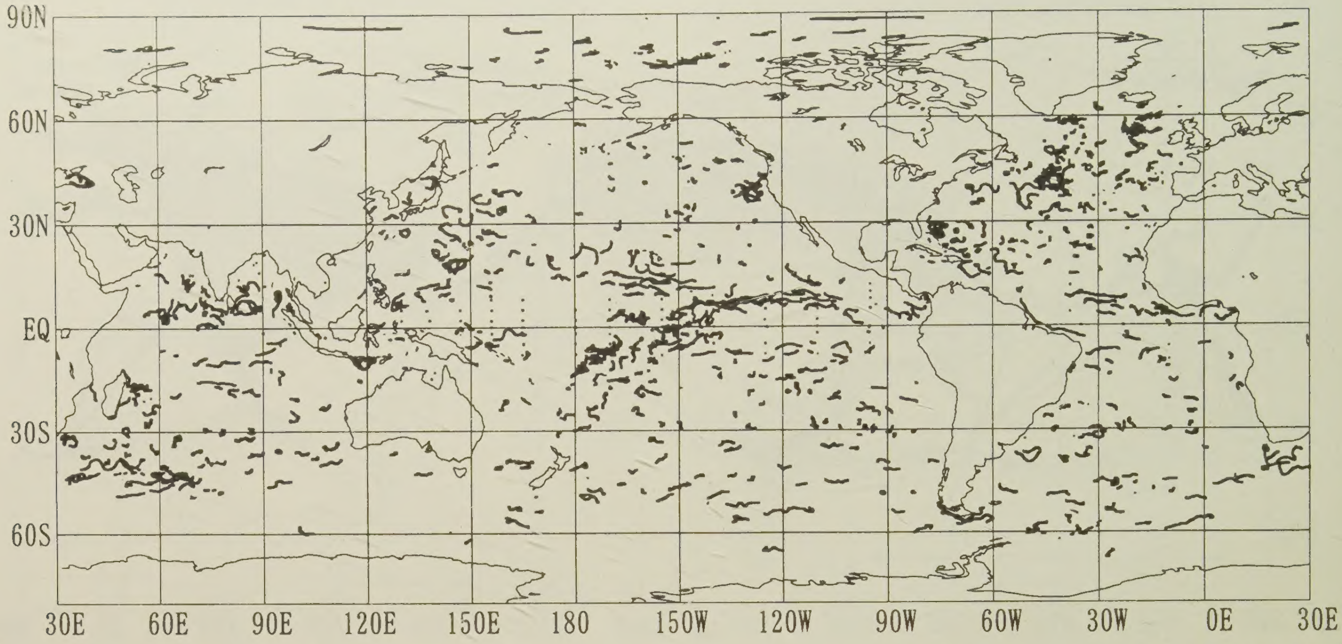
SHIP messages Total data:170394



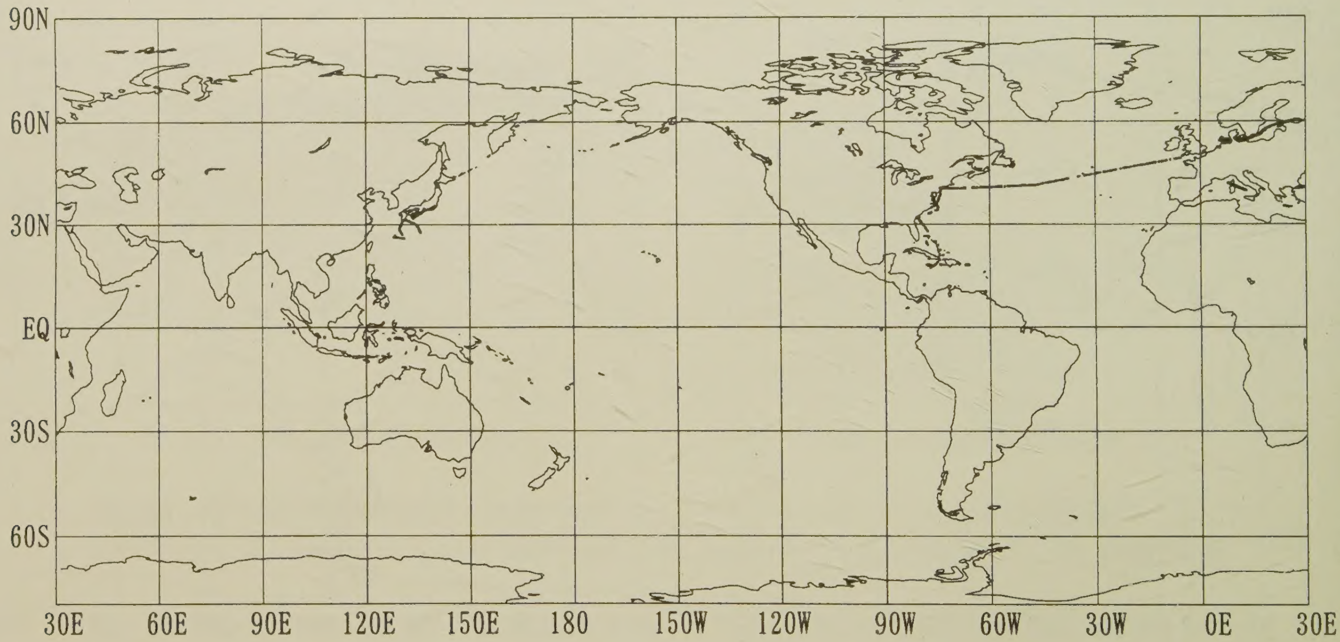
BATHY/TESAC messages Total data: 3514

第32-1図　測点分布図(2002年 9月)

Fig. 32-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for SEP 2002.



BUOY messages Total data:364742



TRACKOB messages Total data: 1960

第32-2図　測点分布図(2002年 9月)

Fig. 32-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for SEP 2002.

気 象 庁 海 洋 月 報

Monthly Ocean Report

September 2002 (No. 117)

本月報掲載の 2002 年 9 月のプロダクトには、気象庁が観測したデータ及び GTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

水産総合研究センター

海洋科学技術センター、（社）漁業情報サービスセンター

東北大学、東京大学、鹿児島大学

水産試験場等（北海道、青森県、岩手県、宮城県、秋田県、山形県、福島県、茨城県、千葉県、石川県、福井県、静岡県、愛知県、三重県、京都府、兵庫県、和歌山県、鳥取県、島根県、山口県、徳島県、高知県、佐賀県、宮崎県）

（順不同）

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